

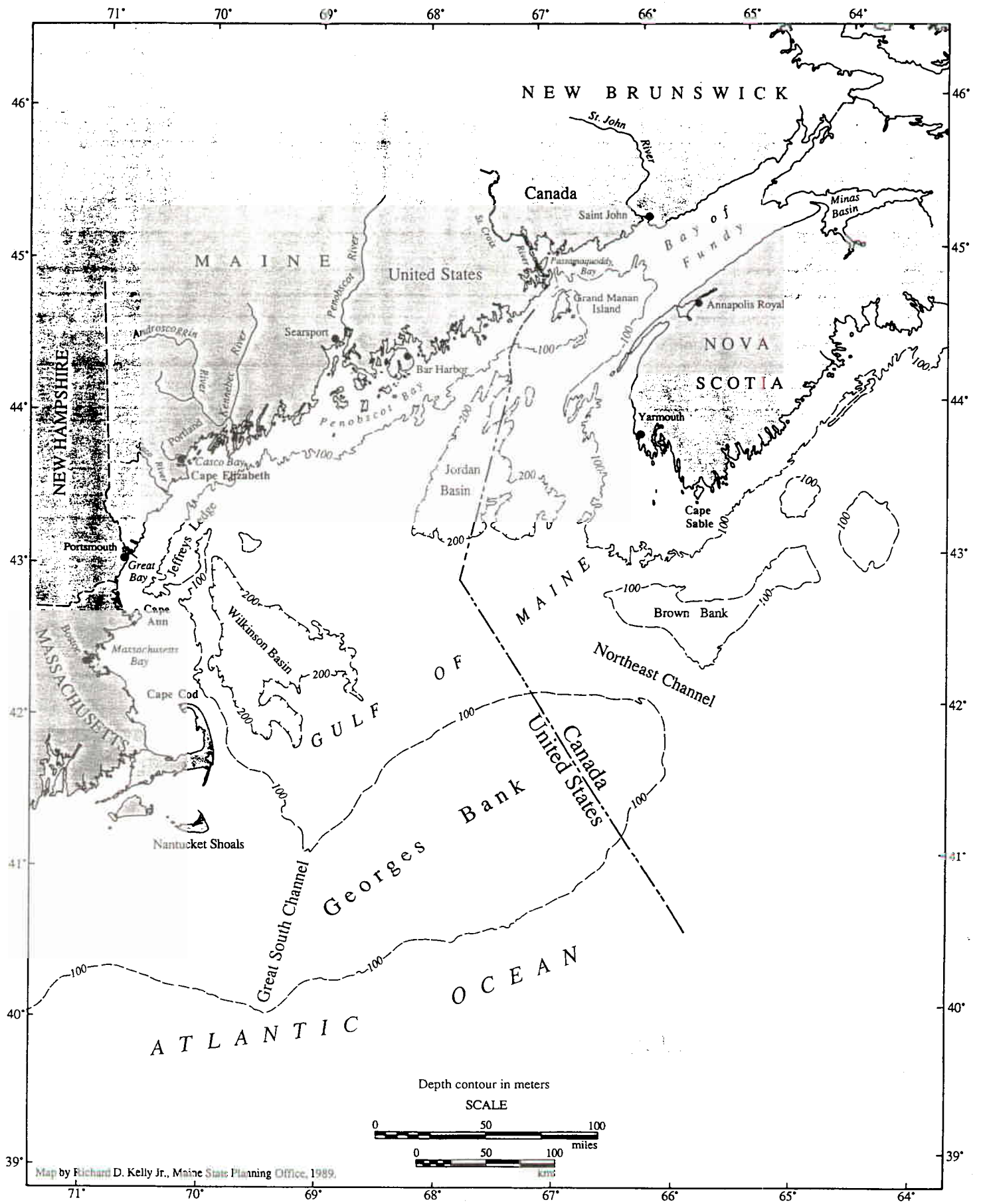


# **POLICY OPTIONS FOR MAINE'S MARINE WATERS**

A Report Of The Marine Policy Committee  
Of The Land And Water Resources Council

Maine State Planning Office  
Maine Coastal Program

October, 1992



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**OF THE**

**LAND AND WATER RESOURCES COUNCIL**

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**Maine Coastal Program  
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October 1992**

## EXECUTIVE SUMMARY

Throughout history Maine's coastal and offshore waters have provided inestimable benefits to the people of the state and region. These waters support valuable economic, social and ecological functions. Much of the state's population is concentrated in the coastal region, which encompasses only 12 percent of the state's land area, yet is home to more than 43 per cent of its population. In addition, the fastest growing areas of Maine are located within the coastal zone. The people of the state have looked towards the sea as a source of food, employment, recreation, knowledge, transportation, waste disposal, and as a symbol of their cultural identity.

Activities in Maine's marine waters are becoming more intense and new uses have recently been introduced. Commercial fishing and lobstering, shipping, recreational boating, whale watching, aquaculture, and waste disposal all occur within the state's coastal waters. Maine's marine waters also support a tremendous diversity of marine life -- in fact, some locations contain the highest diversity reported in the coastal waters of the United States. In some regions of the state it is becoming increasingly difficult to accommodate these multiple -- and often -- conflicting uses and protect the marine environment. In addition, as the uses of the marine environment increase and problems become more complex, coordination among the numerous state and federal agencies becomes more critical, yet more problematic.

Numerous factors suggest that intensifying use of the state's coastal waters is threatening its productivity and that challenges to management are increasing in importance and complexity:

- Competition among marine-related uses is increasing. In working harbors, for example, growing recreational uses and the traditional fishing uses compete for ever more scarce available space;
- Competition between water and non-water dependent uses is also on the rise -- which has obvious implications for the viability of activities at sea. Seasonal and year-round residential development now competes for land that traditionally provided access to the fishing, shipbuilding and other marine industries;
- Aquaculture is a rapidly growing industry in Maine's coastal waters, diversifying Maine's marine economy and challenging the long held tradition of open access to marine resources;
- Signs of degradation of the marine environment are occurring in numerous areas. For example, about one-fourth of the state's shellfish beds are closed or restricted for harvesting due to bacterial contamination;
- Several agencies are involved in decisions which affect the marine environment, yet each is pursuing differing mandates with no system for determining priorities among these mandates;

- Maine ports and harbors represent a finite resource. Of 3,500 miles of coastline, only 10 percent is characterized by deep, sheltered water adequate to support maritime uses. Only a handful of these harbors can serve as ports for large, deep draft vessels; and
- The state's coastal waters make a significant contribution to Maine's economy. Such mainstays of the economy as forest products (through shipping), fishing, tourism, and shipbuilding, are critically linked to the state's coastal waters.

Increases in these demands on the resources will heighten the potential for environmental degradation, conflicts among the various users, and competition for resources and space.

Recognizing the increasing activity in the state's coastal waters and the various separate, but related, government efforts, the Marine Policy Committee prepared this analysis of the issues and activities in the Gulf of Maine that affect the state. This final document incorporates comments and suggestions gathered through a public review process. This report assesses the level of activity in Maine's marine waters and discusses options for developing a comprehensive approach to managing those waters. The geographic focus of the report is primarily from the low-water mark seaward to the three-mile limit of the state's jurisdiction. Activities that occur beyond the state's three-mile jurisdictional limit and in some way affect the state are also considered. The report inventories the state and federal agencies that are engaged in planning or managing the uses of the state's marine waters; discusses several issues and problems with the current approach to managing those uses; and suggests several options that the state should pursue to improve policy and management of Maine's marine waters.

This report builds a case for developing a comprehensive approach to management of Maine's marine environment. Such an approach will lead to better protection of the marine environment and reduce use conflicts through comprehensive policy development, planning, and management. Only in this way will we be able to deal effectively with the many separate but related issues facing the state's marine waters.

The report makes five general findings:

- there is no comprehensive marine policy;
- there is no comprehensive planning in the marine environment;
- there is inadequate coordination among local, state and federal agencies;
- there is a lack of adequate criteria for resolving conflicts among competing uses; and
- there is a lack of adequate information for decision making.

The report also suggests three basic needs of state government with regard to the marine environment:

- a comprehensive multiple-use policy which assures the sustainability of marine habitats and the greatest socio-economic benefit;
- a unified, coordinated, state-wide agenda for the marine environment -- that is, a coordinated effort to determine the state's collective needs and desires with regard to the coastal waters of the state; and
- improved institutional arrangements to facilitate and coordinate policy, planning, and management in the marine environment.

To address these findings and needs the study suggests several options and discusses considerations for:

- developing a comprehensive state policy;
- designing an institutional arrangement to guide policy and planning in the marine environment, a marine and coastal resources council, and consolidation of several closely related marine programs into a somewhat broadened and strengthened Department of Marine Resources.
- applying new management approaches in the marine ecosystem. These tools include: marine resource and habitat inventory and mapping, capability/suitability analyses, marine zoning and special management areas; and

In order to consider the tasks discussed above, the following measures lay the groundwork for a comprehensive marine policy:

#### I. Policy and planning

- recommend priority uses of Maine's coastal waters based on identification of current and potential use conflicts and impacts of uses on both the marine environment and other uses;
- recommend processes for resolving resource-use conflicts;
- recommend steps for protecting critical marine habitats.

#### II. Coordination and cooperation

- recommend methods to better coordinate and consolidate existing policies and programs affecting the use of Maine's marine waters;

- identify opportunities for institutional changes that would improve coordination and efficiency;
- explore opportunities for federal, state and local coordination.

### III. Information management, research, and education

- recommend priority research needs for making management decisions about coastal and marine resources and assess how to better integrate ongoing research and monitoring activities into the decision-making process;
- recommend information requirements for ecosystem management including a computerized mapping program useful for planning and regulatory purposes;
- recommend necessary changes in marine education in the state.

Maine is unique among coastal states in that it has a cabinet-level department whose sole mission is the marine environment. However, most of the Department of Marine Resources (DMR) efforts have been focused on marine fisheries. Given DMR's expertise in the marine environment, its mission should be strengthened and expanded to include several key related programs which are currently dispersed among several other agencies.

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## ***I. INTRODUCTION AND OVERVIEW***

Looking offshore from any of Maine's countless coastal headlands, one could easily believe that the coastal and ocean waters are a vast, empty open space. Nothing, however, could be farther from the truth. Maine's coastal and marine waters are a highly productive environment supporting a variety of activities, and home to a tremendous diversity of marine organisms. The mistaken impression of a limitless ocean, however, has adversely affected the manner in which we have used and managed the marine environment. Management of marine uses and resources has recognized only recently that there are distinct limits to the level of activity that the ocean can sustain.<sup>1</sup>

Activities in Maine's marine waters are becoming more intense and new uses have recently been introduced. Commercial fishing and lobstering, shipping, recreational boating, whale watching, aquaculture, and waste disposal all occur within the state's coastal waters. In some regions of the state it is becoming increasingly difficult to accommodate these multiple -- and often -- conflicting uses. In addition, as the uses of the marine environment increase and problems become more complex, coordination among the numerous local, state and federal agencies becomes more critical, yet more problematic. State government must be able to respond effectively to resolve conflicts and minimize damage to the marine environment.

State government has begun to respond to a number of these critical issues: a subcommittee of the state legislature's Marine Resources Committee issued a report on salmon aquaculture which led to numerous changes in state law to reduce the potential for environmental and resource-use conflicts;<sup>2</sup> the Commission to Study Maine's Oil Spill Cleanup Preparedness released a report which led to a number of changes in state law to prevent and respond to oil spills off the Maine coast;<sup>3</sup> the Maine Marine Research Board issued its first biennial report to the legislature on marine research priorities for the state;<sup>4</sup> in 1989 the governors and premiers of the states and provinces bordering the Gulf of Maine signed an agreement creating the Gulf of Maine Council on the Marine Environment to foster cooperation in managing the gulf. The Council released a ten-year Gulf of Maine Action Plan which outlines goals, objectives, and actions that are needed to wisely manage the gulf's resources;<sup>5</sup> in 1990 the Environmental Protection Agency designated Casco Bay as a nationally significant estuary, setting in motion a

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<sup>1</sup> The terms "marine waters," "coastal waters," and "marine environment" will be used interchangeably throughout this report.

<sup>2</sup> Final Report of the Subcommittee to Study Salmon Aquaculture in Maine to the Joint Standing Committee on Marine Resources, October 1990. State of Maine, 114th Legislature, Second Regular Session.

<sup>3</sup> Report of the Commission to Study Maine's Oil Spill Cleanup Preparedness, November 1990. State of Maine, 114th Legislature, Second Regular Session.

<sup>4</sup> Marine Research Board, Marine Research Priority and Action Plan, Biennial Report, FY 1992-1993, April, 1991.

<sup>5</sup> Gulf of Maine Working Group, The Gulf of Maine Action Plan, prepared for the Gulf of Maine Council on the Marine Environment, 1991, Augusta, Maine.

five-year federal-state-local effort to restore and maintain the environmental quality of this important region; and an interagency Marine Policy Committee, a subcommittee of the Land and Water Resources Council, has been established to coordinate state-wide marine policy.

Recognizing the increasing activity in the state's coastal waters and the various separate, but related, government efforts, the Marine Policy Committee prepared this analysis of the issues and activities in the Gulf of Maine that affect the state. This report assesses the level of activity in Maine's marine waters and discusses options for developing a comprehensive approach to managing those waters. The geographic focus of the study is primarily from the low-water mark seaward to the three-mile limit of the state's jurisdiction. However, to assure that a truly "comprehensive" state approach is developed, activities that occur beyond the state's three-mile jurisdictional limit and in some way affect the state, are also considered. This study does not examine in detail management issues and needs of each particular use, but focuses on how each of the various uses and policy issues affect one another and the environment.

The objectives of this report are to: (1) review and summarize activities currently occurring in the state's marine waters and the state's role in managing those activities; (2) identify conflicts among uses of the state's coastal waters; (3) identify gaps and inconsistencies in the state's management of those uses; and (4) provide recommendations for improving management of the state's marine waters.

The ultimate goal of this report is to stimulate the development of a comprehensive policy for the state's marine waters. This policy will build on existing policies that affect Maine's marine waters, including the nine Coastal Management Policies enacted into law in 1986<sup>6</sup> and the more specific policies set forth in the numerous laws and regulations that affect the state's coastal waters.

This report should be viewed only as a first step, intended to stimulate discussion and catalyze agencies and citizens into action. These discussions and actions should then lead to more effective, comprehensive management to replace the present, piecemeal approach. A new comprehensive approach should be consistent with the goal of Maine's Coastal Program: "to achieve a balance between conservation and development in the coastal area that will satisfy short and long-term social, economic and environmental needs." In addition the goals of a comprehensive policy for the state's marine waters should:

1. ensure the equitable allocation of benefits derived from the state's marine waters;
2. minimize conflicts among users;
3. promote sustainable use of the marine environment;
4. protect the ecological integrity of state's marine waters for use by current and future generations;

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<sup>6</sup> 38 MRSA 1801-1803

5. increase awareness of the importance of our marine resources; and
6. preserve traditional activities with significant socio-cultural value.

The remainder of this chapter provides an overview of the importance of the marine environment to the state of Maine, a discussion of the state's jurisdiction over the marine waters, and the need for new approaches to managing the marine environment. Chapter II discusses the level of use in Maine's coastal waters; Chapter III inventories the local, state and federal agencies which have authority in the marine environment; Chapter IV discusses the issues, problems, and opportunities that the state is facing in managing its marine environment; and Chapter V describes some options for developing a comprehensive policy and planning approach to managing Maine's coastal waters.

#### *A. Coastal Maine Demographic and Economic Trends 1991 - 2005*

Population growth in Maine (Figure 1) is projected to be a modest 1.2% over this time period, and employment will increase by 11.6%. Coastal counties will generally outpace the statewide growth rate, but at a much diminished level from the previous decade. The closing of Loring Air Force Base in 1994 will be the largest factor in the state's low growth, causing an outmigration of 8,000 individuals from Maine in that year alone. Yet, recession-related population and job loss in the coastal zone will also contribute. The Kittery/Portsmouth Naval Shipyard will shrink its workforce by 800 in 1992. Cuts in defense spending may cause Bath Iron Works to layoff 4,000 workers between 1992 and 2005.<sup>7</sup>

**Table 1**  
**Maine Coastal County Population & Projections**

	<u>1986</u>	<u>% Change</u>	<u>1990</u>	<u>% Change</u>	<u>2005</u>
York	158,800	3.6%	164,587	1.39%	166,858
Cumberland	228,100	6.59%	243,135	2.9%	250,287
Sagadahoc	31,700	5.7%	33,535	1.7%	34,130
Lincoln	28,300	7.2%	30,357	4.09%	31,601
Knox	35,100	3.4%	36,310	.95%	36,658
Waldo	30,100	9.6%	33,018	3.36%	34,130
Washington	33,900	4.1%	35,308	3.82%	36,658

*Source: Bureau of the Census, Maine State Planning Office*

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<sup>7</sup> Economics Division, Maine State Planning Office.

# Maine Population Estimates and Projections

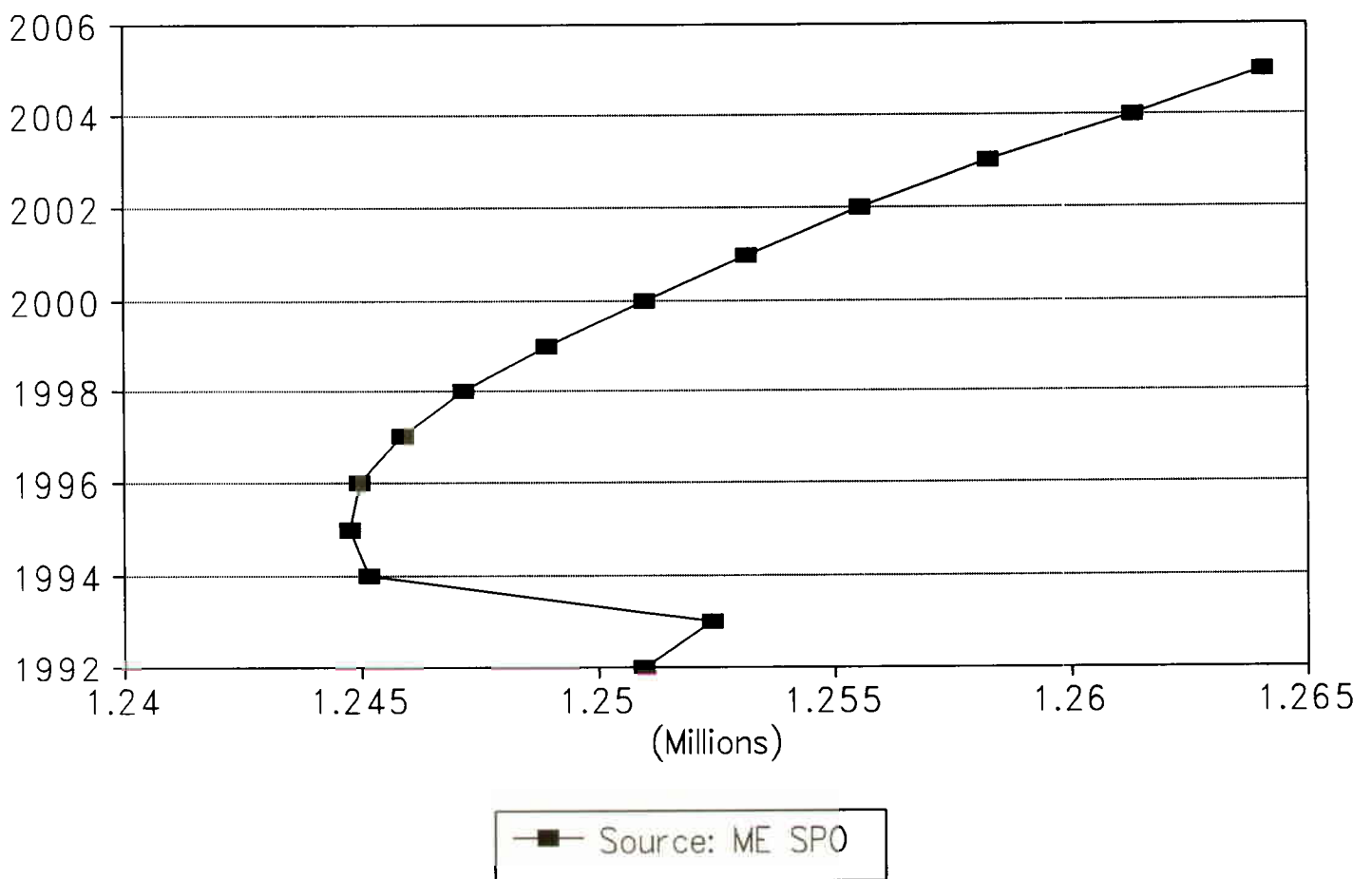


Figure 1

**Table 2**  
**Maine Coastal County Employment**

	<u>1986</u>	<u>1990</u>	<u>% Change</u> <u>('81 - '86)</u>	<u>% Change</u> <u>('86 - '90)</u>
Construction	24,522	28,803	17.45%	63.39%
Manufacturing	50,643	54,328	7.27%	-2.68%
Transportation/Utilities	12,226	13,678	11.5%	16.22%
Trade	76,760	87,981	14.61%	32.20%
Services	106,065	103,608	-2.31%	35.57%
Government	49,502	53,456	7.98%	5.09%

*Source: Bureau of the Census, Maine State Planning Office*

The declines in statewide population growth projected to the year 2005 and drop in employment seen since 1986 defines a trend recently documented for the entire Gulf of Maine region.

The rapid growth of the 1980's is not likely to be replicated in the 1990's, as cyclical forces in demography and the economy lead to a period of slower change. But economic growth will most likely continue at a slow and steady pace, with many of the changes in the southern and western parts of the Gulf spreading to the northern and eastern regions. Thus, issues created by the trends of the 1980's will continue to grow in significance well into the 1990's...<sup>8</sup>

Growth, as suggested by the employment table, may well be strongest in residential/commercial construction and wholesale/retail trade. What remains clear is that Maine's marine resources and environment will continue as prime factors in coastal economic growth and that landside growth will stress both the resources and environment. Though at a slower pace than in the past decade, there will be increasing

pressure to convert marine waterfronts to residential and commercial uses, ...increasing use of ports and harbors, especially during the summer, ...increases in housing construction throughout the region, ...increasing use of the Gulf for waste disposal.<sup>9</sup>

These development pressures also create a change in the amount and means of waste disposal. Such issues will continue to be of concern in the years ahead.

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<sup>8</sup> Colgan, Charles S. "Economic Growth Trends On The Gulf of Maine Littoral." The Gulf of Maine, NOAA Coastal Ocean Program Regional Synthesis Series Number 1, U.S. Department of Commerce, February 1992.

<sup>9</sup> *ibid.*, pg. 112.

Rapid development of trade and services implies significant increases in automobile usage and the necessity to pave and more intensely utilize ever increasing amounts of land for shopping malls, office parks, and parking facilities... Such growth, therefore, will likely increase waste disposal problems confronting the Gulf. Increased automobile traffic, from both the resident and tourist populations, means increased anthropogenic hydrocarbon residues entering the Gulf in the runoff of the increasingly paved landscape. Other waste residue problems, such as runoff from combined sewer overflows, will continue to grow.... In short, point sources of pollution are being replaced by non-point sources as a direct result of the changing structure of the economy operating along the Gulf's shores.<sup>10</sup>

Experts have suggested specific examples of these demographic and economic trends affecting the coastal environment/resources which may occur by the end of the 1990s. In every decade since 1940, Maine has had a coastal real estate boom. These booms have moved incrementally up the coast, reaching Washington County between 1986 and 1990. While the state will experience a drop in home construction and retail outlet growth over the coming 3 - 5 years, a coastal land boom should return by the decade's end, driven by a revived southern New England economy. Simply put, Maine offers the last relatively affordable coastal property in New England. When the boom recurs, the pattern will repeat itself, with York County feeling the effects first. Yet, certain communities such as Belfast and Ellsworth which were discovered late in the last boom may get new investment quickly this time.

Within the coastal zone, Ellsworth, in particular, can expect service/trade expansion. In 1985, Irving Oil located its credit card service center for the U.S. and Canada there. Anchored by Acadia National Park, factory outlets will increase in Ellsworth, drawing other retail investment. With Ellsworth as a node, residential growth should spread both east and west along the coast, as the interior region is largely unsettled.

Finally, the plan for daily rail service between Boston and Portland has the potential to alter growth patterns in southern Maine. Initial service will keep the cities separated by a two hour commute. Introduction of high-speed rail service is possible in ten to fifteen years. A forty minute commute to Boston makes southern Maine a potential suburb of Boston, where land for residential growth is at a premium. High speed commuter rail service has the potential to increase residential and commercial growth in southern Maine dramatically, with serious implications for how coastal land and waters are used.<sup>11</sup>

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<sup>10</sup> Colgan, Charles S., "Economic Growth Trends on the Gulf of Maine Littoral." The Gulf of Maine. NOAA Coastal Ocean Program Regional Synthesis Series Number 1. U.S. Department of Commerce, February 1992, p.116.

<sup>11</sup> The demographic and economic trends section is based on personal communication with Charles Colgan, Muskie Institute, University of Southern Maine.

## *B. Maine and the Sea*

Throughout history Maine's coastal and offshore waters have provided inestimable benefits to the people of the state and region. These waters support valuable economic, social and ecological functions. The people of the state have looked towards the sea as a source of food, employment, recreation, knowledge, transportation, waste disposal, and as a symbol of their cultural identity.

In 1988, business and industry, either directly or indirectly supported by Maine's marine waters, account for about 25,000 employees, or 4 percent of a work force of 600,000. The total earnings generated by the marine-related and associated industries in the state were about \$500 million annually. Additionally, the value of the products produced by these industries was about \$800 million, which represents about 4 percent of the gross state product.<sup>12</sup> Figures 2 and 3 depict the break down of the various marine industry sectors and their respective employment and earnings.

The state issued about 14,000 licenses in 1990 to commercial fish harvesters who landed about 170 million pounds of fish and shellfish worth about \$130 million.<sup>13</sup> The state ranked 9th in the nation in volume landed and 6th in value. Maine's commercial ports handle forest products, steel, fertilizer, tapioca, coal, agricultural products and over 13 million tons of petroleum annually. Maine's beautiful seacoast has recently begun attracting large passenger cruise ships, with Maine ports hosting over 60 ship calls per year and expected to handle over 90 in the summer of 1991. In addition, Maine's public and private marine research institutions attract millions of dollars from federal and private sources to support research in the Gulf of Maine and around the world.

Other uses of Maine's marine waters, such as recreational boating, whale watching, wildlife tours, and aquaculture, have increased in recent years. Finfish aquaculture production, for example, has quadrupled in just three years increasing to 4.6 million pounds in 1990 worth over \$15 million.<sup>14</sup> A recent report on aquaculture in Maine estimates that projected value of aquaculture products during the next decade could equal -- or exceed -- the annual value of landings for all traditional fisheries.<sup>15</sup> Recreational boating has increased substantially as well over the last 20 years. The number of recreational boats registered in Maine and using coastal waters has grown from 21,000 in 1970 to 56,000 in 1989. In addition, the numbers of unregistered recreational boats, such as kayaks, small sailboats and sail boards, are increasing.

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<sup>12</sup> Stephen J. Adams, "Economic Contribution of the Maine Marine Industries Complex to the Maine Economy," A paper prepared for the Department of Commerce, National Estuary of the Month Seminar, 1988.

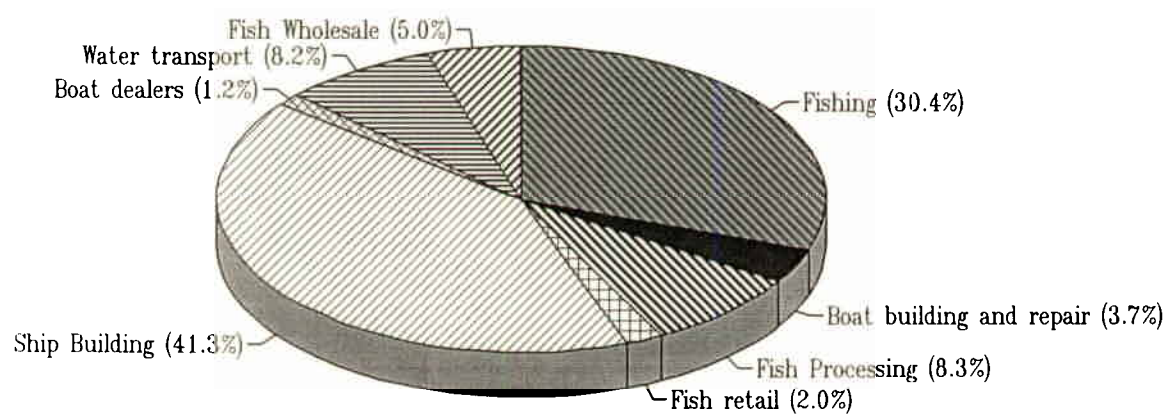
<sup>13</sup> This figure represents the amount of money paid to the fishermen for their harvest, i.e., the landed value. The market or retail value of the resources is considerably higher.

<sup>14</sup> Laurice Churchill, Maine Department of Marine Resources, personal communication, May 16, 1991.

<sup>15</sup> Maine State Planning Office, An Aquaculture Development Strategy for the State of Maine, Executive Summary, March 1990.



Employment in Maine's  
Marine Industries



**Figure 2**

Maine's marine waters also support a tremendous diversity of marine life -- in fact, some locations contain the highest diversity reported in the coastal waters of the United States. These waters are home to at least 1,600 different types of bottom-dwelling organisms, about 100 types of birds, 73 different types of fish and 26 different kinds of whales, porpoises and seals.<sup>16</sup> This high diversity of sea life is supported by a variety of marine and estuarine habitat types. Salt marshes, eel grass beds, muddy and sandy sediments, gravel beds, rocky substrates, sheltered coves, high energy environments and variable levels of salinity and temperature are all present in Maine's coastal waters.

The state's marine waters support a range of users which include commercial and recreational fishermen, shippers, aquaculture companies, industries, and the recreation-seeking public, and also host myriad marine life forms, from the periwinkle to the humpback whale. Given the variety of activity and diversity of marine life, conflicts inevitably result between the various users and interests. As uses intensify, conflicts among the user groups and between users and the marine environment will increase. Government, however, can play a substantial role in managing these uses and protecting the values of the marine environment. The basis for this role is described below.

### *C. State Jurisdiction and Control*

All coastal states have been granted, by the 1953 federal Submerged Lands Act, title to and ownership of the lands lying beneath navigable waters and the natural resources within such lands and waters within three miles of the coast.<sup>17</sup> Thus, the state has jurisdiction and stewardship responsibilities over the waters and submerged lands contiguous to the 3,500 miles of Maine's coastline from mean-low tide seaward to three miles offshore. This area encompasses some 3.5 million acres of coastal waters and submerged lands, roughly equal to 18 percent of the state's total land area.<sup>18</sup> In general, the state has the exclusive right and power to manage, administer, lease, develop, and use the submerged lands and resources in accordance with state law.<sup>19</sup>

State government's legal authority to manage the public's use of the submerged lands and waters stems from the public trust doctrine. The doctrine is derived from Roman civil and English common law that defines the nature of public and private interests in a state's coastal waters

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<sup>16</sup> U.S. Fish and Wildlife Service, An Ecological Characterization of Coastal Maine, Volume Two, 1980.

<sup>17</sup> 43 U.S.C. 1301-1315. See also, United States v. Maine (U.S. Me. 1975) 95 S.Ct. 1155, 420 U.S. 515, 43 L.ed 2d 363, where the Supreme Court held that the U.S. was entitled, to the exclusion of the Atlantic seaboard states, to exercise sovereign rights over the seabed and subsoil underlying the Atlantic Ocean, lying more than three geographical miles seaward from the ordinary low-water mark, extending seaward to the edge of the continental shelf; and that the rule, that the paramount rights to the offshore seabed inhere in the U.S. as an incident of national sovereignty, was confirmed by the Submerged Lands Act of 1953 and the Outer Continental Shelf Lands Act of 1953.

<sup>18</sup> Maine Geological Survey estimate.

<sup>19</sup> See Section III for a discussion of the specific powers and duties of state agencies with respect to managing particular uses in Maine's marine waters.

and intertidal and submerged lands. The state holds these lands and waters in trust for the benefit of and use by the public. The authority vested in the State through the public trust doctrine is based on its power over state property, rather than the regulating private property through the State's "police powers." The State can govern and manage the waters and living resources within the scope of the doctrine as its own property.

In Maine, the public trust doctrine applies to both public and private land. Unlike the most coastal states, the land between mean high tide and low water in Maine is privately owned but the public maintains the right to use these areas for fishing, fowling, and navigation -- the so called public trust rights.<sup>20</sup> It is important, however, to distinguish between the intertidal and submerged lands. Beyond mean-low tide, the state owns the submerged lands and has the authority to convey those lands to private parties for various purposes as long as those uses do not unreasonably interfere with the public trust rights and other existing uses. The submerged lands are public resources and must be managed in such a way to protect and enhance those resources.

The state exercises its public trust obligations through state laws carried out by numerous state agencies. Fishing, aquaculture, polluting activities, coastal and submerged lands development, oil transportation, and other activities are regulated to some degree by state government. In addition, numerous wildlife and habitat protection programs have been established by agencies to preserve these resources for future generations.

While the state holds title to the submerged lands and has the right and power to manage activities within three miles of the coast, the federal government has retained its constitutional power to regulate and control the submerged lands for purposes of commerce, navigation, national defense, and international affairs. The federal government's role in environmental protection is also significant. As will be discussed in later sections, the federal and local governments' presence in regulating and managing uses within Maine's state waters is considerable.

Beyond the state three-mile limit, the federal government maintains jurisdiction and authority to the 200-mile limit of the U.S. Exclusive Economic Zone. Overlapping the state's submerged lands is the U.S. territorial sea out to 12 miles offshore. The territorial sea was recently expanded from three to 12 miles by Presidential proclamation.<sup>21</sup> In the territorial sea, the U.S. exercises the same sovereignty as it does over its land territory with the exception that it must allow for the innocent passage of ships. Beyond the territorial sea is the exclusive

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<sup>20</sup> The Maine Law Court decided in 1989 in Bell v. Town of Wells (557 A.2d 168 (Me.1989)) that the public trust doctrine in Maine does not include the right of the public to use these areas for general recreational purposes. The term "general recreation" is used to distinguish it from the recreational pursuit of fishing and navigation. See, also, A. Rieser, Public Trust, Public Use, and Just Compensation, 42 Maine Law Review, 5-41 (1990).

<sup>21</sup> Proclamation No. 5928, 54 Fed. Reg. 777 (1989). For numerous points of view on the legal effect of the extension of the territorial sea, see, Territorial Sea Journal, Vol.1, No. 1, 1990, pgs. 1-190.

economic zone. In this area, the federal government exercises exclusive authority to protect and conserve the marine environment, regulate the exploration and exploitation of mineral resource, fisheries, scientific research by foreign nationals and other activities.

The state's interests, however, do not stop at the three-mile limit of its jurisdiction. Activities which occur beyond the three-mile limit have the potential to adversely affect the state's resources and the livelihoods of its citizens. In addition, Maine people have an economic interest in the conservation and rational development of the EEZ.<sup>22</sup> The New England Governor's Conference recognized the states' interests in the exclusive economic zone by proclaiming, on behalf of their citizens, "direct and inherent rights and responsibilities pertaining to the protection, conservation and development of the living and nonliving resources now under domestic jurisdiction within the U.S. Exclusive Economic Zone" and by asserting that the New England states "must be full partners [with the federal government] in the management of U.S. EEZ resources and share in an equitable division of benefits derived from their development."<sup>23</sup> From a legal standpoint state government has the authority to review activities in federal waters that may affect the state's coastal resources to ensure that the activities are consistent with the state's coastal management plan.<sup>24</sup> In addition, recent amendments to the federal Coastal Zone Management Act authorize coastal states to develop ocean management plans to address issues beyond their three-mile limit. The new amendments acknowledge that coastal states have "substantial and significant interests" in the activities occurring in and resources of the exclusive economic zone.<sup>25</sup>

#### *D. New Management Approaches are Needed*

Numerous factors suggest that intensifying use of the state's coastal waters is threatening its productivity and that challenges to management are increasing in importance and complexity:

- Competition among marine-related uses is increasing. In working harbors, for example, growing recreational uses and traditional fishing uses compete for ever more scarce available space;

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<sup>22</sup> Coastal States Organization, Coastal States and the U.S. Exclusive Economic Zone, (Washington, DC, Coastal States Organization), April, 1987.

<sup>23</sup> New England Governor's Conference, Inc. "Resolution Number 64 Pertaining to the Protection, Conservation and Development of Resources of the United States Exclusive Economic Zone," December 15, 1987.

<sup>24</sup> Under the consistency provisions of the federal Coastal Zone Management Act states with federally approved coastal management programs are authorized to review federal and federally permitted activities (located inside or outside the coastal zone) that may affect coastal resources to ensure that the activities are consistent with the state's coastal management program and policies. (16 U.S.C. 1451 et. seq.)

<sup>25</sup> Coastal Zone Management Act, 1990 Amendments 16 U.S.C. 1451(m), see, Tim Eichenberg, "State Jurisdiction Under the Coastal Zone Management Act After Extension of the Territorial Sea." Territorial Sea Journal (forthcoming).

- Competition between water and non-water dependent uses is also on the rise -- which has obvious implications for the viability of activities at sea. The Maine coast, comprises 12 percent of the state's land area, yet supports 43 percent of the population and 65 percent of Maine's jobs. Seasonal and year-round residential development now competes for land that traditionally provided access to the fishing, shipbuilding and other marine industries;
- Aquaculture may continue as a rapidly growing industry in Maine's coastal waters, diversifying Maine's marine economy and challenging a tradition of open access to marine waters;
- Signs of degradation of the marine environment are occurring in numerous areas. For example, about one-third of the state's shellfish beds are closed or restricted for harvesting due to bacterial contamination from sewage pollution;
- Several agencies are involved in decisions that affect the marine environment and no state forum exists for resolving disputes between different interests and different state agencies. The Maine and New Hampshire Port Safety Forum sponsored by the U.S. Coast Guard is an example of a forum established to address spill prevention;
- Enforcement of existing regulations in such a large and dispersed area is difficult;
- Maine ports and harbors represent a finite resource. Of 3,500 miles of coastline, only 10 percent is characterized by deep, sheltered water adequate to support maritime uses. Only a handful of these harbors can serve as ports for large, deep draft vessels; and
- As stated previously, the state's coastal waters make a significant contribution to Maine's economy. Such mainstays of the economy as forest products (through shipping), fishing, tourism, and shipbuilding, are critically linked to the state's coastal waters.

Continuing increases in these demands on the resources will heighten the potential for conflicts among the various users based on competition for resources and space, and environmental degradation.

While the state has made significant progress in managing its marine and coastal resources and their uses, many of these efforts have been fragmented. Governmental activities have been directed at specific resources or problems without sufficient consideration to the impact on other resources and activities. Responsibilities for managing Maine's coastal and marine resources are scattered among numerous agencies with differing and sometimes conflicting mandates. For example, one state agency (Department of Marine Resources) is responsible for managing the state's fishery resources, while another state agency (Department of Environmental Protection) is responsible for protecting the environment in which those resources

live. Management of the state's coastal waters is further complicated by jurisdictional lines which divide state, federal, and Canadian legal authority but do not respect the ecosystem's integrity. Therefore, the way in which Maine's marine waters are used may have important consequences for other states and provinces and vice versa.

Increased use of Maine's marine waters in the future is likely. Without changes to our planning and regulatory framework, use conflicts and environmental degradation will continue and may lead to lost social and economic benefits to Maine people and a decline in the health of the marine ecosystem. State government should develop a comprehensive planning and management approach to better anticipate impacts; minimize use conflicts; and increase coordination among state agencies, the federal government, Canada, and the neighboring Gulf of Maine states. Unlike many other coastal states' marine waters, those off the coast of Maine are relatively healthy. All too often management follows only after a crisis results. Fortunately, we have the luxury to plan for a future that is consistent with the state's needs and desires. This report is intended to spark discussion about this new future and lead to its realization.

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## II. USE OF MAINE'S MARINE WATERS

Maine's coastal waters and the Gulf of Maine traditionally have supported a wide variety of uses, most notably fishing and commerce. Over 5,000 years ago prehistoric peoples fished these waters for cod and haddock. The first Europeans settled along the coast in the 1600s, drawn to this area because of the plentiful stocks of fish. Shipping and ship building have also played major roles in the state's economy. Today, in addition to those traditional uses of the sea, Maine's marine waters also support relatively newer uses, such as recreational boating, aquaculture and waste disposal. As the use of marine waters intensify and the change, conflicts among the different uses have increased. This section provides the reader with a broad assessment of the variety and magnitude of uses that Maine's coastal waters support as well as describe the type of conflicts that exist.

### A. Aquaculture

To supplement the harvesting of marine resources from natural populations, aquaculture, or the "farming" of the sea, has become common practice worldwide. Only recently, however, has the United States demonstrated an interest in aquaculture in the marine environment. Maine's coastal waters provide a prime environment for the culture of fish and shellfish because of the numerous protected coves and bays, high flushing rates, relatively clean waters, and proximity to markets.

Maine's aquaculture industry, virtually non-existent 20 years ago, has emerged as a significant and growing use of the state's coastal waters. Both finfish and shellfish are produced in coastal waters which are leased by the state to private operators. These species include blue mussels, hard clams, oysters, salmon, and sea-run rainbow trout. Shellfish are generally produced by bottom culture and salmon are produced using floating net pens. Other species that are under investigation for future production include seaweed species, haddock, lobster, sea scallops, and halibut.

Growth of the industry increased rapidly throughout the 1980s, but has slowed in this decade.<sup>26</sup> In 1991 there were 86 fish and shellfish leases totalling over 1,100 acres of coastal waters. Leases are located along the entire Maine coast with 45 percent located east of Bar Harbor. Other clusters of leases are located along the Blue Hill peninsula, near Damariscotta and Bristol, and in southern Maine from Freeport to York and Kittery. Currently, there are 67 aquaculture lease sites covering 1,165 acres of bottom. The decline has come in shellfish (mussel) leases. Leases have been turned in by some mussel farmers who have discovered there is currently little difference in costs and profits between growing mussels and dragging for wild ones.

The number of sites leased for salmon farms in Maine's coastal waters has increased from zero to 45 in just five years. Currently, salmon farms are exclusively located east of Penobscot

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<sup>26</sup> See, State Planning Office, An Aquaculture Development Strategy for the State of Maine. (State Planning Office, Augusta, ME, 1990).



Bay, with the majority located in Cobscook Bay, because of favorable water temperatures. With the advent of new technology, however, the possibility exists that salmon aquaculture could develop in the mid- and southern coast areas as well.<sup>27</sup>

The value of cultured fish and shellfish has increased rapidly over the past decade. In 1979, seafood produced by aquaculture was valued at \$450,000. In 1991, salmon and rainbow trout production of 10.4 million pounds had a landed value of about \$30 million, which grew from about 4.5 million pounds in 1990 with a landed value of \$16 million. 1992 figures will probably not show the yearly doubling in production and value that has been the hallmark of Maine finfish aquaculture. Estimates are that 15.5 million pounds of fish will be produced worth \$45 million.

Continued growth and stability in Maine finfish aquaculture is less than certain. Substantial increases in international production of farm-raised salmon has led to a marketplace glut and reduced profit margins which threaten the viability of some Maine growers. An industry source believes that 1993 may bring a contraction in both fish production and profits from 1992 levels.

Chile, with considerably lower production and regulatory costs, has become Maine's largest competitor in the price-driven U.S. market. Previously intent on expanding facilities, Maine salmon aquaculturists are now focused on shaving production costs, and have made progress. Efforts to expand the U.S. market into regions such as the Midwest are also underway, with less attention given to creation of value-added products. A U.S. and Canadian trade group has proposed a law suit against Chile for price dumping, echoing action taken earlier against Norwegian salmon exporters.<sup>28</sup> Yet, one industry representative believes the effort will fail as Chilean salmon prices are based on genuinely lower costs and not market manipulation.<sup>29</sup> A possible limit on that country's salmon aquaculture industry is its warmer waters, which make the threat of disease more likely than in Maine.

The combined production glut and price competition could have serious implications for many of Maine's fifteen salmon producers. Most companies are small, under capitalized and may be unable to survive an extended market downturn. Yet, an expression of optimism in the industry's future can be seen in the four salmon aquaculture lease permits now being reviewed by the Department of Marine Resources. Despite tenuous conditions, new investment in Maine fish farming continues. Some effort is also being devoted to appraisal of new species for aquaculture, with halibut seeming the most promising.

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<sup>27</sup> Currently aquaculturists are prevented from using waters west of Penobscot Bay because of the problem of "superchill" which kills the salmon as a result of the colder winter water temperatures in these areas. While the average temperature in waters of Cobscook Bay may be colder than those of Casco Bay, for example, the extremes are greater in Casco Bay. New hatchery techniques are being developed which would allow the salmon to grow to a later life stage in the hatchery and thus spend less time in the sea and grow to market size in less than a year, thus not requiring the salmon to stay in the cages during the winter months.

<sup>28</sup> Rivara, Greg, "Aquaculture in Maine: Problems and Prospects," Northeast Aquaculture Spring 1992.

<sup>29</sup> Sebastian Bell, Connors Aquaculture, Inc., personal communication, July, 1992.

Shellfish aquaculture in Maine has developed along a different path than finfish aquaculture. Companies selling American oysters, oyster seed and mussels are small-scale, family businesses which began with individual R&D efforts to determine the viability of growing shellfish in Maine estuaries. The critical mass of businesses and expertise are located on the Damariscotta River where five companies are active. In fact, the six shellfish leases currently under consideration by DMR are all sited in the Damariscotta River. Proceeds from shellfish hatchery and growout were \$2 million in 1991, estimated at \$2.5 million this year and expected to be \$10 to \$12 million in five years, according to an industry source.<sup>30</sup> To date, no market constraints have been identified which would limit the growth of this industry. Currently, aquaculturists are exploring the potential for raising other shellfish species, including surf clams and softshell clams.

### Use Conflicts

Possible conflicts between proposed finfish aquaculture leases and other commercial or recreational marine uses are considered as part of the application process by Maine's Department of Marine Resources. Nonetheless, a recent study urges an increased role for government in this regard.

A proactive governmental role in selecting aquaculture sites can resolve siting conflicts, avoid adverse impacts on sensitive resources, minimize interactions between farmed and wild salmon stocks, and reduce permitting inefficiencies for small-scale operations. Although aquaculture zoning programs in Norway, Prince Edward Island, and other areas, have worked well to achieve these goals, similar programs lack political support in New Brunswick and Maine. Nevertheless, these programs could provide substantial benefits for the industry.<sup>31</sup>

A concern expressed by industry members and other observers is that salmon farming may be obstructed from expanding down the coast from its Washington County base by lobstermen and summer residents. Both groups are more numerous in the Frenchman's Bay, Penobscot Bay and Midcoast regions and will fight the loss of fishing grounds and intrusions in coastal waters, respectively.<sup>32</sup> Within Washington County, aquaculturists are anxious that a reheating of the residential real estate market there could hamper purchase and use of shorefront property by the industry.

Water quality is of concern to salmon farmers for whom this resource is their crop's growing medium. Washington County's limited development and high flushing rates in coastal waters produces high water quality, yet degradation by oil spills and chemicals remain as threats. But are there effects to water and marine life by aquaculture's own effluents, feces and

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<sup>30</sup> Bill Mook, Mook Sea Farms, personal communication, July, 1992.

<sup>31</sup> Tim Eichenberg, Legal Methods for Promoting Local Salmon Farming Operations in DownEast Maine, Marine Law Institute, University of Maine School of Law, February 1992.

<sup>32</sup> "Maine hauls up a way to find other fish in sea," Boston Sunday Globe, June 7, 1992.

food from net pens? Initial research work at Cobscook Bay fish farm sites by UM Darling Center scientists indicates that certain marine environments can absorb these wastes and remain healthy.<sup>33</sup>

The threat of declining water quality in estuaries is an obvious potential use conflict for shellfish growers. Consequently, aquaculturists are very active in volunteer water quality monitoring on the Damariscotta River. Growth in recreational boating is also a trend which concerns shellfish growers on the Damariscotta. They wonder whether increasing numbers of boats and boat use will lead to diminished water quality. Aquaculturists also acknowledge that growth in moorings could make use of their leases more constrictive and increase boater - aquaculture conflicts.

### *B. Marine Transportation*

#### Cargo Port Traffic

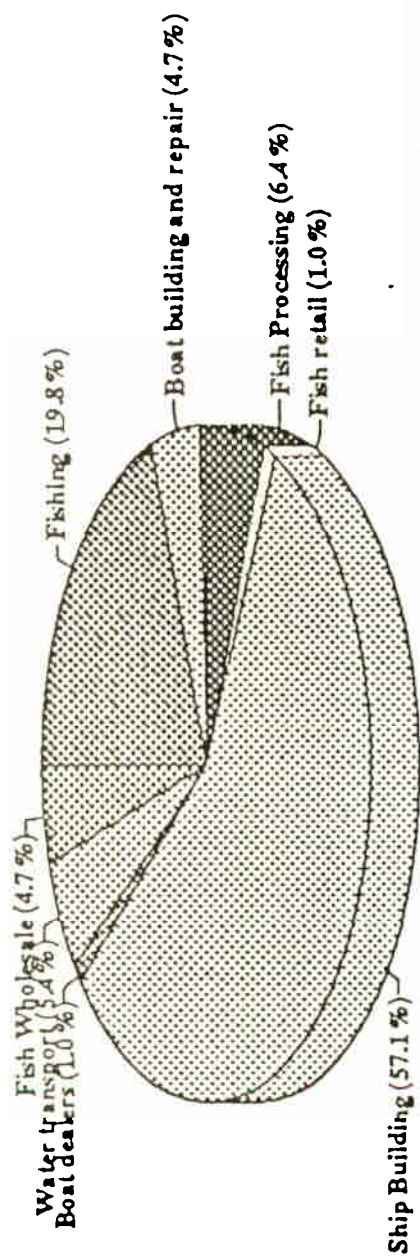
All manner of goods are transported by sea into Maine's ports and harbors. Oil, bulk goods, wood products, frozen foods, passengers, and tourists all move through Maine's coastal waters by ship. Vessels of various kinds using the state's coastal waters serve as important links to Maine's many offshore islands, to Canada and to a growing tourist trade through the use of cruise ships.

Overall, commercial vessel traffic along the Maine coast has increased slightly over the past 15 years and in all sectors of marine transportation there is evidence and future expectations of growth. During the past ten years, the amount of dry cargo transported through Maine ports has nearly tripled to about one million tons, but due to the recession, dry cargo traffic was off by 5.7% in 1991 (Figure 3). In 1988, 51 percent of this cargo passed through Searsport, while 35 percent was handled by Portland, 13 percent by Eastport and one percent by Winterport. Dry cargo transport is increasingly focusing on export of forest products and manufactured goods to international markets. Driving this trend are the recently negotiated free trade agreements with Canada and Mexico and the current multilateral trade negotiations involving 120 nations. Searsport has the most potential to benefit from increased export markets, because of its central location as the shipping point for twelve major forest products mills.<sup>34</sup> Eastport--serving fewer mills--will see more limited growth, but has begun development of a new marine cargo facility. Since October 1991, Portland has been a stop for a new container feeder service. The service offloads containers holding products from Europe and Canada and takes on goods

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<sup>33</sup> "Aquaculture: The future has begun." Maine Times. August 28, 1992.

<sup>34</sup> Work on the proposed Sears Island Marine Terminal is at a standstill with an island causeway, pier site dredging and some site work having been completed. The Environmental Protection Agency is currently investigating the terminal project to ascertain whether information on island wetlands was withheld to speed project approval. "EPA reportedly starts probe into Maine island cargo plan." Boston Sunday Globe June 7, 1992. Despite this delay, Maine DOT believes the terminal will be completed in several years. A draft Secondary Environmental Impact Statement on the project will be released in Spring 1993.



Percentage earnings in Maine's Marine Industries

Figure 3

MAINE PORT TRAFFIC  
(Dry Cargo)

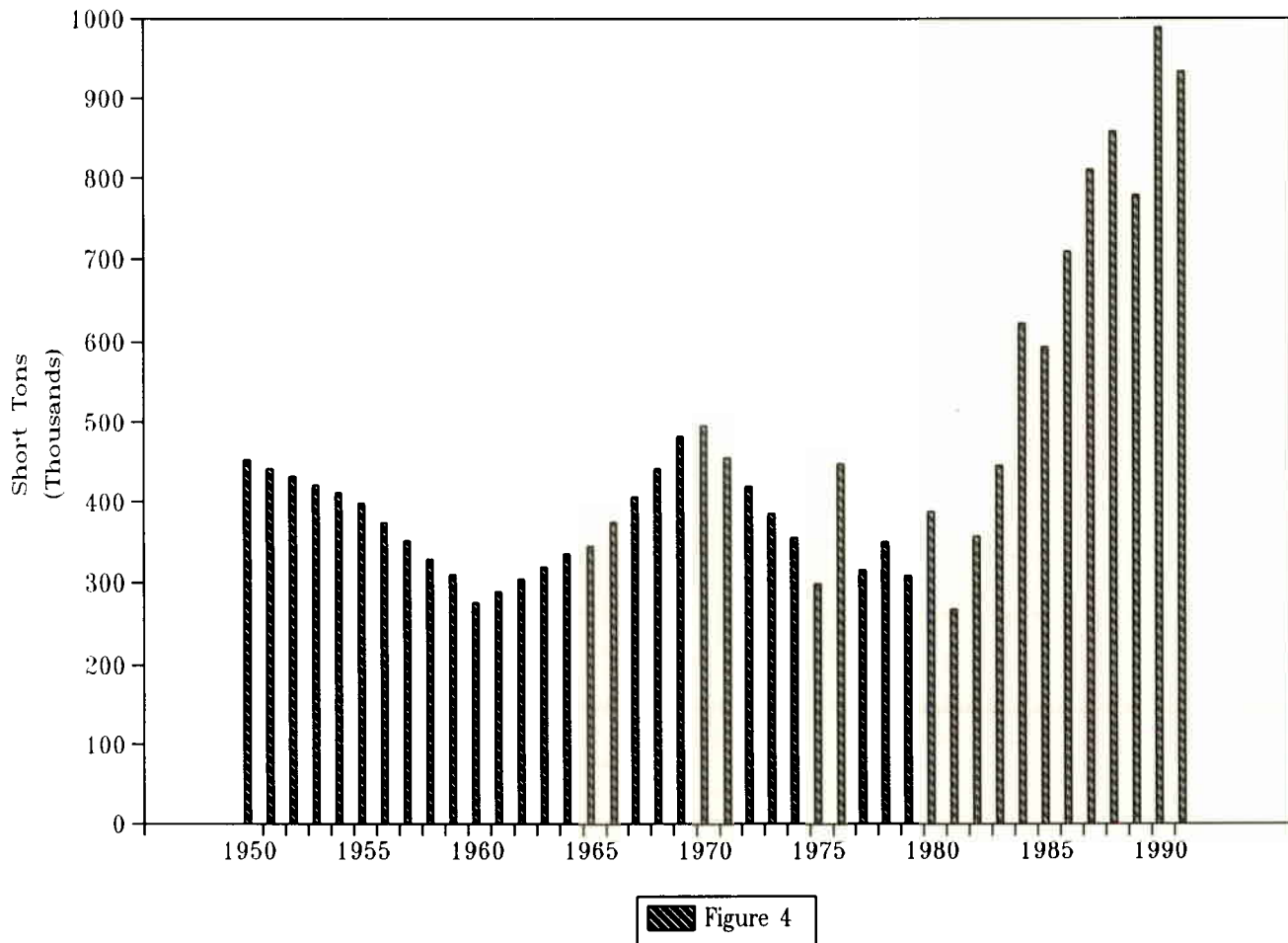


Figure 4

destined for those markets. This container cargo feeder service improves the access of Maine businesses to international markets.

While oil traffic has decreased markedly since the early 1970s, as indicated by Figure 5, in recent years there has been a steady increase in the amount of oil flowing through the state's ports. Since 1986, oil shipments have increased 64 percent. 1991 saw a 6-15% increase in oil traffic over 1990. Indications are that this trend will continue as demand increases in Canada and Maine, as production decreases in western Canada, and as new oil is developed offshore Newfoundland, Can. In fact, the Portland Pipeline, which transports the vast majority of oil brought into Portland to Montreal, is expecting a doubling of oil traffic over the next two to five years.<sup>35</sup> The Portland Pipeline Terminal currently services ten vessels a month.

Maine's major commercial ports include Portland, Searsport/Bucksport, and Eastport. In addition, jet fuel is transported via pipeline in Searsport to Loring Air Force Base. Additional traffic off the Maine coast is bound for Portsmouth, N.H. and St. John, New Brunswick.

### Cruise Ships

Cruise ships have recently begun visiting Maine's coastal waters. Maine Department of Transportation policy is to attract this trade. As a result of the Achille Lauro tragedy, the cruise-ship industry began looking for alternative destinations. This led to an increase in cruise-ship traffic in Maine's coastal waters; the recent Persian Gulf war will again increase cruise-ship traffic to the state. Prior to 1985, only 3 - 6 vessels visited Maine yearly. Today, Maine ports average about 65 arrivals per year ranging from 250 to 1200 passengers on each ship (and with crew sizes ranging from 75 to 500). While the number of calls has varied over the last three years, transportation officials predict modest, steady growth of 13% annually in the coming years. Portland, Boothbay Harbor, Camden, and Bar Harbor are major destinations for cruise ships. Each cruise-ship passenger can expect to spend about \$60 while in each port-of-call while crew members reportedly spend \$30. This translates into a total of \$3 to \$5 million pumped into the local economies of the various ports.<sup>36</sup> Portland, which has been used solely as a port-of-call by cruise ships, is seeking to become a home-base port for the cruise industry. Home-base ports must offer major air and land transportation links and passengers traditionally spend three times as much in them as at ports-of-call. An indirect economic impact of the cruise business in Maine is the likely return of passengers for landside vacations here.<sup>37</sup>

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<sup>35</sup> Ralph Wink, Portland Pipeline, personal communication, March 15, 1990.

<sup>36</sup> Based on Maine Department of Transportation estimates, Rob Elder, personal communication, July 9, 1991 and Port of Halifax Cruise Ship Economic Impact Study.

<sup>37</sup> Transportation to the Year 2002: A Capital Improvements Plan for Maine (Draft), Maine Transportation Capital Improvement Planning Commission, 1992.



OIL TRAFFIC THROUGH MAINE PORTS  
(Short Tons)

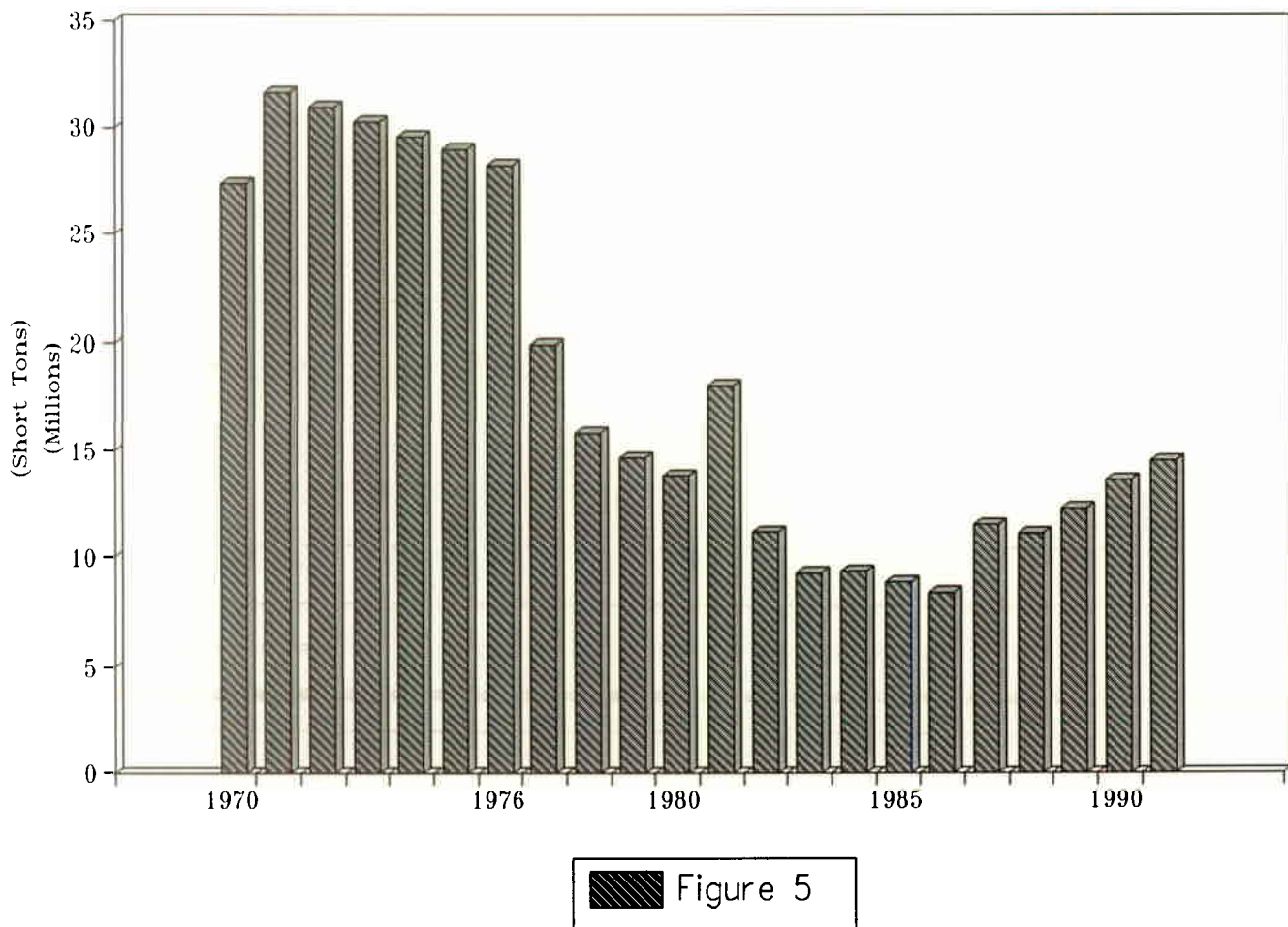


Figure 5

## Ferry Service

Maine's coastal waters are also used by ferries serving Canada and Maine's numerous offshore islands. More than 60 boat cruises, excursions and charters also operate along the coast. Ferry traffic serves commuters, tourists, and provides goods to island communities. Ferry ridership has steadily increased throughout the last decade largely due to tourism, which results in a seasonal pattern of ridership with peak travel occurring from late spring to early fall and then falling off to relatively low levels throughout the remainder of the year. Islands served by ferries include Vinalhaven, North Haven, Swan's Island, Islesboro, Long Island, Monhegan, and Matinicus in the Penobscot Bay/mid-coast region and Little Diamond, Great Diamond, Long Island, Peaks, Cliff, and Great Chebeague Islands in Casco Bay. In addition, international ferries provide services from Portland and Bar Harbor to Yarmouth, Nova Scotia, and from Eastport to Deer and Campobello Islands in New Brunswick.

In the past three years, vehicle and passenger use has increased on the Maine State Ferry System by more than 3% annually, reflecting both a growth in tourism and second home development on the islands served. This modest growth trend will continue in the 1990s. Ferries connecting Islesboro and Peaks islands to the mainland also serve a considerable number of year-round commuters. A recent transportation planning document acknowledged the link between island use, growth and ferry service, noting that "level of service and user fares can have a major influence on the rate of development of the islands..."<sup>38</sup> State transportation policy is beginning to reflect this: in June 1992, the Department of Transportation raised rates for discretionary ferry users, while rates remain stationary for island residents. Bicyclists now pay as much as \$20 to bring bikes to Vinalhaven, up from \$6.75 a year ago. The rates are preferential toward islanders who depend on the ferry service and reflect island dislike of cyclists, considered both a nuisance and a hazard.<sup>39</sup>

## Use Conflicts

Aside from the influence that marine transportation can have on land use as discussed above, a number of other use conflicts are apparent. Increasing oil transportation in Maine waters raises the likelihood of oil spills with potentially devastating effects on coastal resources and economies. The state's capacity to respond to spills has been under study for several years and the Department of Environmental Protection has released a draft Marine Oil Spill Contingency Plan.<sup>40</sup> Also, oil terminal owners in Portland and South Portland have recently formed Clean Casco Bay, Inc. to respond to oil spills there.

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<sup>38</sup> Transportation to the Year 2002: A Capital Improvements Plan for Maine (Draft). Maine Transportation Capital Improvement Planning Commission, 1992, pp.4-14.

<sup>39</sup> "Islands have put up a barrier." Maine Times. June 6, 1992.

<sup>40</sup> Report of the Commission To Study Maine's Oil Spill Preparedness, November, 1990. and Progress Report Of The Commission To Study Maine's Oil Spill Preparedness, November, 1991. Office of Policy and Legal Analysis, Maine Legislature. Marine Oil Spill Contingency Plan (Draft), June, 1992. Maine Department of Environmental Protection.



A second use conflict in marine transportation was recognized in the findings of the Commission To Study Maine's Oil Spill Clean-Up Preparedness: "The Commission finds that the issue of recreational boaters in commercial shipping lanes poses a great threat to public health and safety. The issue requires actions in numerous fields with the support of many groups outside the oil transportation field."<sup>41</sup> The Commission later clarified this finding to state that the threat derives from "public or recreational boaters causing spills due to unsafe operation."<sup>42</sup> Marine transportation officials cite further examples of this general conflict. Kayakers, now numerous in coastal waters, are not picked up by vessel radar and are nearly invisible at dusk or on foggy days. A kayak - commercial vessel collision has potential to occur. Also, small, recreational boats without radar often attempt to follow ferries into port under low light or foggy conditions, increasing the risk of collision between them.

### *C. Marine Recreation*

#### Boating

Maine's coastal waters have seen explosive growth in recreational activity including pleasure boating, tourism, recreational fishing, whale watching, sea kayaking and other activities. As Figure 5 indicates the number of boats registered in the state that use Maine's coastal waters has nearly tripled from about 21,000 in 1970 to 56,000 in 1989. Most of this increase came during the 1970s, growth has been relatively flat since that time. An additional 2,000 boats are documented with the U.S. Coast Guard and may not necessarily be registered with the state.<sup>43</sup> However, the number of boats registered elsewhere but sailing or motoring in Maine probably grew markedly over the decades.

A recent survey of more than one thousand coastal and inland waters boaters by the Bureau of Parks and Recreation concluded that other factors have increased boat use, as well.<sup>44</sup> BPR found that the amount of boating activity per boat owner increased by nearly 5% annually from 1977 (date of last survey) to 1990, a trend likely to continue and one BPR called "dramatic." These findings buttress the agency's general observation of greater use at state boat access sites and mesh with the notion of boating as popular among an aging national population with disposable income. Other results from the survey found that two thirds of boating activity is on freshwater, the remainder on saltwater.

Another indication of the level of recreational boating activity is the number of moorings and waiting lists for moorings in Maine's harbors. There are about 11,000 moorings in the state's coastal waters according to a survey conducted in 1989 by the Department of Economic

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<sup>41</sup> Progress Report of the Commission To Study Maine's Oil Spill Preparedness. November, 1991. Office of Policy and Legal Analysis, Maine Legislature. p. 31.

<sup>42</sup> Final Report of the Commission To Study Maine's Oil Spill Clean-UP Preparedness, June 1992, p.1.

<sup>43</sup> All boats over 5 gross registered tons are required to be documented with the U.S. Coast Guard but do not have to register with the State of Maine.

<sup>44</sup> 1991 Boat Users Survey. Bureau of Parks and Recreation, Dept. of Conservation, September 1991.

and Community Development (DECD).<sup>45</sup> An additional 1,110 people are on waiting lists for moorings in various coastal towns. In addition, there are about 125 marinas in the state with several thousand slips. Marinas in Portland and South Portland alone, for example, contain roughly 1,500 slips.<sup>46</sup>

Since the 1989 mooring survey by DECD, the Southern Maine Regional Planning Commission has conducted a berthing study for York County which suggests that the pressure on moorings and slips continues in places.<sup>47</sup> Sixteen hundred names appear on waiting lists for moorings and slips there. The study predicts a 7% annual increase in demand through the year 2000 with a deficit of moorings and slips of 3,120 by that time. It is important to remember that these pressures are currently location-specific and not coast-wide. In the DECD study, York County towns accounted for 70% of the waiting list entries. This is an expected outcome given the county's wealth, population density and proximity to New Hampshire and Massachusetts.

The steady state of boat registration in Maine coastal waters begs the question, why is there a sizable waiting list for moorings in a number of coastal towns? A number of answers apply. Many people traded smaller boats for ones requiring a slip or mooring during the decade. Increasing numbers of summer residents with a boat registered in their home state are mooring it in Maine. Anecdotal evidence suggests that both resident and non-resident boaters are applying for moorings in a number of harbors along the coast to accommodate cruising. Finally, in some harbors waiting lists apply only to prime locations with less desirable moorings still available.

In communities with mooring backlogs, the usual scenario is that locations to moor boats are available. Recent conversations with harbor masters indicate that often, moorings could be expanded to outer harbors and other areas but for the lack of shore access and parking. Are Maine towns likely to expend the effort to increase their mooring fields? Unlikely, if they follow the trend in southern New England. There, according to one source, townspeople believe there are too many boats in their harbors, fear environmental damage and are vetoing expansion.<sup>48</sup> These actions should lead to marina expansion, through increased slips or boat "parking garages" where vessels are removed for use at the customer's request. Maine towns with perennial mooring waiting lists will see marina growth in this decade. Others may not, due to much of the coast's distance from major population centers and the state's short boating season.

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<sup>45</sup> This information was collected from 78 harbors. No information was received for 50 coastal communities, of which 18 have significant harbors. see, Harbor Ordinance and Mooring Survey, September 11, 1989, Department of Economic and Community Development.

<sup>46</sup> Maine Department of Environmental Protection, 1989. Agenda for Action: Casco Bay. (Department of Environmental Protection, Augusta, ME).

<sup>47</sup> Southern Maine Regional Planning Commission, Southern Maine Regional Berthing Study. An Analysis of Boating Facility Supply and Demand Along the York County Coast, June, 1991.

<sup>48</sup> Neil Ross, International Marina Institute, personal communication, July, 1992.

## Sea Kayaking

The most noticeable growth in recreational boating on the Maine coast has been in sea kayaking. Several recreation-oriented businesses such as L.L.Bean, Inc. have been promoting the sport through kayaking clinics and symposiums for eleven years and are responsible for much of its increase here. Each year, Bean's sea kayaking symposiums are fully enrolled (400+ participants) and the company sponsors kayaking activities year-round. While sea kayak sales were slow for L.L. Bean in the late 1980s (<10% growth annually) they have increased markedly in this decade. The company expects low double digit growth annually over the next five years in sea kayaks.<sup>49</sup> Bean's customer base for sea kayaks is broadening. In earlier years, sea kayakers tended to be outdoor enthusiasts who also did cycling and rock climbing. Currently, the buyers are often upper middle class families and retired couples. Kayak specialists at Bean estimate that half the kayaks they sell remain in-state and that Maine has become an acknowledged center for sea kayaking.

Maine Island Trail Association (MITA), Rockland, has also promoted sea kayaking through creation of the Maine Island Trail, a 325 mile small boat waterway extending from Casco Bay to Machias Bay. This association for recreational users of coastal islands has grown to a membership of 2,600 in five years, adding 500 new members each year, with good prospects for continued growth. It is estimated that fully 40% of membership use sea kayaks on the trail.<sup>50</sup> We should expect kayaks to be a common sight on Maine coastal waters in the years ahead.

## Wildlife Sightseeing

Whale-watching and other wildlife sightseeing cruises (e.g. for seabirds and seals) off the Maine coast are other activities that have grown substantially in the past ten years. On Mt. Desert Island, for example, the number of people using whale-watching services (from Bar Harbor, Northeast Harbor and Bass Harbor) jumped from about 30 people per day in 1985 to about 600 people per day at the height of the season in 1990.<sup>51</sup> Whale-watching boats leave principally from Kennebunkport, Boothbay Harbor, and Bar Harbor, while other coastal and marine wildlife sightseeing trips leave from numerous spots on the coast, including Portland, Camden, New Harbor and other towns. About 11 companies now ferry tourists and researchers to sites offshore in search of humpback and fin whales. These vessels not only bring in dollars to the local economy, but provide valuable platforms for seabird and whale research. In fact, 80 percent of fin whale research in the Gulf of Maine is funded using commercial whale-watching vessels.<sup>52</sup>

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<sup>49</sup> Andy Shepard, L.L. Bean, Inc. personal communication, June, 1992.

<sup>50</sup> Cate Cronin, Maine Island Trail Association, personal communication, June, 1992.

<sup>51</sup> Robert Bowman, College of the Atlantic, personal communication, November 19, 1990.

<sup>52</sup> *ibid.*

## Sportfishing

Recreational fishing is another use gaining popularity in Maine's coastal waters. Of the numerous species sought after by recreational fishermen, the most popular are bluefish, mackerel, groundfish, and tuna. Accurate figures on the number of recreational fishermen using Maine's coastal waters are not available, however, since the state does not require a recreational saltwater fishing license. The National Marine Fisheries Service, however, estimates a total of about 267,000 recreational fishermen used Maine's coastal waters in 1987<sup>53</sup> resulting in a total economic impact of \$325 million.<sup>54</sup>

Sources familiar with saltwater sportfishing in Maine suggest there has been a modest--not dramatic--increase over the past decade and a change in the kind of fishing done. For years, saltwater sportfishing here was primarily for cod, other groundfish, and mackerel. With the decline in groundfish stocks and return of striped bass and bluefish to Maine waters, sportfishing has shifted to these migratory species. An L.L. Bean, Inc. spokesman ties their growth in saltwater fishing tackle (low double digit annually over last several years) to the rebound in these fish stocks.<sup>55</sup> During the late 1980s, Maine anglers also began pursuing shark and bluefin tuna as gamefish. A final trend in angling along the Maine coast is the interest in saltwater fly fishing for stripers and bluefish. While marketers term the increase in this sector "exciting" they admit that the number of participants remains small. L.L. Bean, Inc. offered its first saltwater fly fishing school this summer.

A sportfishing journalist and Boothbay charter boat captain believes saltwater angling in Maine will never see more than incremental growth; nor will the state become a saltwater fishing destination. The range and quality of saltwater fishing here does not match that of southern New England and the Mid-Atlantic states, where warm Gulfstream waters hold more gamefish species.<sup>56</sup> In Maine, the charter boat fishing business has declined along with inshore groundfish stocks. Charter boat captains now offer wildlife cruises and tours to combat the loss of groundfish and a short season.

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<sup>53</sup> U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, September, 1988. Marine Recreational Fishery Statistics Survey, Atlantic and Gulf Coasts, 1987. (National Marine Fisheries Service: Washington, DC).

<sup>54</sup> "Economic impact" is defined as the amount an individual who participates in recreational fishing actually spends to participate in the activity. These numbers were derived by adding the total expenditures of all the recreational fishermen using Maine's coastal waters (both residents and nonresidents). See, Boyle, Kevin J., et.al, 1990. "Economic Values and Economic Impacts Associated with Consumptive and Nonconsumptive Uses of Maine's Fish and Wildlife Resources." A Report to the Commission to Study the Impact of Game and Nongame Species on Maine's Economy. Staff Paper No. 410, Department of Agricultural and Resource Economics, University of Maine.

<sup>55</sup> Brock Apfel, saltwater tackle buyer, L.L. Bean, Inc., personal communication, July, 1992.

<sup>56</sup> Barry Gibson, Editor Saltwater Sportsman, Chair, New England Fisheries Management Council, charter boat captain, personal communication, July, 1992.

## Use Conflicts

Conflicts in recreational boating echo those described in marine transportation. The Commission To Study Maine's Oil Spill Clean-Up Preparedness has acknowledged pleasure boat collisions due to unsafe operation as a threat to lives and the environment. The likelihood of kayak-sail/motor boat collisions is probably greater than that of kayaks and commercial vessels. Sometimes, the volume and speed of boat traffic in coastal waters creates conflict. Recently, the Portland Press Herald printed a request from the city's harbor master to boaters who normally pass between Peaks and Great Diamond islands to use an alternative route. Island residents had complained about moored boats and floats being disrupted by speeding boats.<sup>57</sup> Perhaps other boat traffic problems can be addressed similarly.

As harbors are more heavily used, conflicts arise. In Yarmouth, lobstermen are anxious about the loss of territory to pleasure boats and moorings, though they are allowed to place traps in mooring areas.<sup>58</sup> Fishermens' fears have been borne out in Rockport. The town recently passed an ordinance banning lobster pots within the harbor from April to November as they are considered a navigational hazard by recreational boaters.<sup>59</sup> Commercial fishermen working out of Southwest Harbor complain that the opening of a new marina in the harbor has resulted in pleasure boats operating at night and cutting through their gear.<sup>60</sup> Such conflicts can be resolved. The Bar Harbor harbormaster has negotiated a voluntary agreement between lobstermen and cruise ship captains establishing a vessel traffic lane. Resolution came without loss of access to fishermen.<sup>61</sup>

Increasingly, commercial fishermen and sportsmen are at odds over a target, often diminished, resource. The latter, including charter boat operators, blame the former for making inshore waters barren of groundfish. They claim groundfish can only be found further at sea than recreational anglers can go. Commercial fishermen are now locked in a battle with sportsmen over quotas for bluefin tuna taken in western Atlantic waters. The fishermen believe they are being forced to accept cuts in their quota to the benefit of politically-connected sportsmen. The regulating agency, the National Marine Fisheries Service, is also taking into account the commercial importance of the sport fishing and charter industry to the Atlantic and Gulf Coast states.<sup>62</sup>

A microcosm of the general dispute has been seen recently on the Presumpscot River, where the New England Coast Conservation Association claims commercial pogie fishermen are disrupting sport fishing. The Association believes that in harvesting baitfish from the river,

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<sup>57</sup> "Harbor chief asks fast boaters to use 'Escape Channel'," The Portland Press Herald, June 22, 1992.

<sup>58</sup> Mike Munroe, Yarmouth harbormaster, personal communication, July, 1992.

<sup>59</sup> "Lobster gear in conflict," Maine Times, July 7, 1992, pg. 8.

<sup>60</sup> "Summer colony or tourist attraction?," Maine Times, September 24, 1992.

<sup>61</sup> Ivan Rasmussen, Bar Harbor harbormaster, personal communication, July, 1992.

<sup>62</sup> "Tuna rules pit sport, commercial fisheries," The Boston Globe, May 24, 1992, pg. 27.



commercial fishermen are also decreasing the number of stripers and bluefish in the river available to sportsmen.<sup>63</sup> With the decline of East Coast fish stocks and commercial fishing, we are seeing the rise of saltwater sportsmen as a political bloc, willing to make a case for their economic importance and equal rights to the fishery.

#### *D. Waste Disposal<sup>64</sup>*

While not traditionally viewed as a use of the sea in the same manner as those described previously, for years the state and federal governments have sanctioned the use of Maine's coastal waters for disposal of wastes. Industry, municipalities, vessels, and dredging of the state's ports and harbors produce wastes, some of which are disposed of in the marine environment. In addition, runoff from the state's cities and farms also contributes pollution to the coastal waters.

***Dredge Spoil Disposal*** -- Removing bottom sediments from channels, harbors, and ports is a necessary fact of commerce. It allows ships and recreational boats to move freely in and out of the state's harbors. Once bottom sediment is dredged, it must be disposed of on land or at sea or used in some beneficial manner, such as beach nourishment. Unfortunately, ports and harbors are generally the most polluted parts of our coastal waters, which is no surprise given the heavy activity in and around these areas. Ocean disposal of dredged material, which may be contaminated with any number of pollutants such as PAHs, PCBs, and metals, disperses the pollutants into estuarine or ocean sites potentially causing ecological problems in those areas. In addition, the dredging activity itself can cause problems by physically disrupting the bottom-dwelling animals and by exposing them to the pollutants that have been re-suspended. The natural hydrology of estuarine areas may also be modified by the removal of bottom sediments.

Decisions on the location of disposal sites for dredged material are based principally on economic considerations, such as the cost of hauling the material to the site and, in the case of a land-based site, any fees required for its use. In Maine's case, the vast majority of dredged material has been disposed of in estuarine or marine waters, because this method is usually deemed the least expensive alternative -- since barging is cheaper than trucking and there are no fees for the use of an ocean disposal site. This calculation, however, fails to consider the true cost to the marine environment in the form of any damage that may occur as a result of the dumping activities. Given scarce land areas for disposal of dredged material and increased pressure to create more marinas and to increase activities in the state's commercial ports, the need for ocean disposal will likely increase. In the near term, however, two events are causing a decline in both dredging and ocean disposal of dredged material. First, the federal government has increased the local cost share for federally assisted dredging projects.<sup>65</sup> The result has been for

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<sup>63</sup> "Pogie Fishing On The Presumpscot River At Issue," The Notes, Yarmouth, Maine, July 11, 1992.

<sup>64</sup> For an in depth look at the sources and types of pollution affecting Maine's coastal waters see, Doggett, Lee and John Sowles, 1989. Maine's Marine Environment a Plan for Protection: A Report to the 114th Legislature. (Augusta, ME: Department of Environmental Protection).

<sup>65</sup> Maine Coastal Program, Maine State Planning Office, Maine's Dredging Management Strategy. A Report to the Marine Policy Committee and the Maine Land and Water Resources Council, September, 1991.

communities to request funding help from the state and has forced state agencies to think critically about where they want to spend money in order to support marine resource industries. Second, the on-going recession has depressed coastal development. The upshot is that the Maine Geological Survey has seen a decline in the number of private and public dredging projects proposed in Maine. While the volume of private dredge projects will rebound with the economy, public projects will remain at a diminished level as long as the present funding formula remains in force.

Between 1950 and 1989 the U.S. Army Corps of Engineers conducted 98 dredging projects in Maine, removing some 4.5 million cubic yards of dredged material.<sup>66</sup> Currently, 79 coastal towns have had some degree of dredging by the Army Corps and numerous other coastal towns have private dredging projects. Roughly 3 million cubic yards of dredged material were disposed of in Maine's coastal waters between 1982 and 1989. Disposal of the material occurred as follows:

Ocean sites	41 %
Estuarine sites	36 %
Upland sites	15 %
Unidentified	8 %

Dredged material is disposed of either in permanent, EPA approved-ocean disposal sites, or in *ad hoc* Corps nearshore disposal sites if the dredging project is located too far away from an EPA site (see Figure 6 for the disposal distribution among the different sites). Officially designated ocean disposal sites are located off Cape Arundel in southern Maine, Portland, and Rockland. The Cape Arundel site, located several miles offshore the southern Maine coast, is used by the Port of Portsmouth and several small harbors in southern Maine. The Portland site, which receives dredged material from Portland harbor, is located just outside western Casco Bay, about seven miles offshore at a depth of about 150 feet. The Rockland site is located offshore Rockland and serves Rockland harbor and several other small harbors in Penobscot Bay. Additionally, numerous other sites along the coast are used on a project-by-project basis. Furthermore, numerous inactive sites are located in Maine's coastal waters; the location of many are no longer known.

**Point-Sources** -- Nearly 60 municipal sewage treatment plants discharge directly into marine or estuarine waters. Thirteen plants which discharge into estuarine and marine waters only provide primary treatment. Maine Yankee Atomic Power Plant and several fossil fuel-powered electrical generating plants use tidal waters to cool turbines. Almost 3000 residential overboard discharge licensees exist along the Maine coast. In 1987, the Maine Legislature prohibited the construction and use of new overboard discharge systems and required the gradual

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<sup>66</sup> The U.S. Army Corps of Engineers is responsible for maintaining the navigability of the nation's waterways including its coastal waters and is therefore responsible for dredging activity in the state's coastal waters. see, Maine State Planning Office, Dredging Management Strategy, draft, May 1991.

# BOATS REGISTERED IN MAINE'S COASTAL WATERS

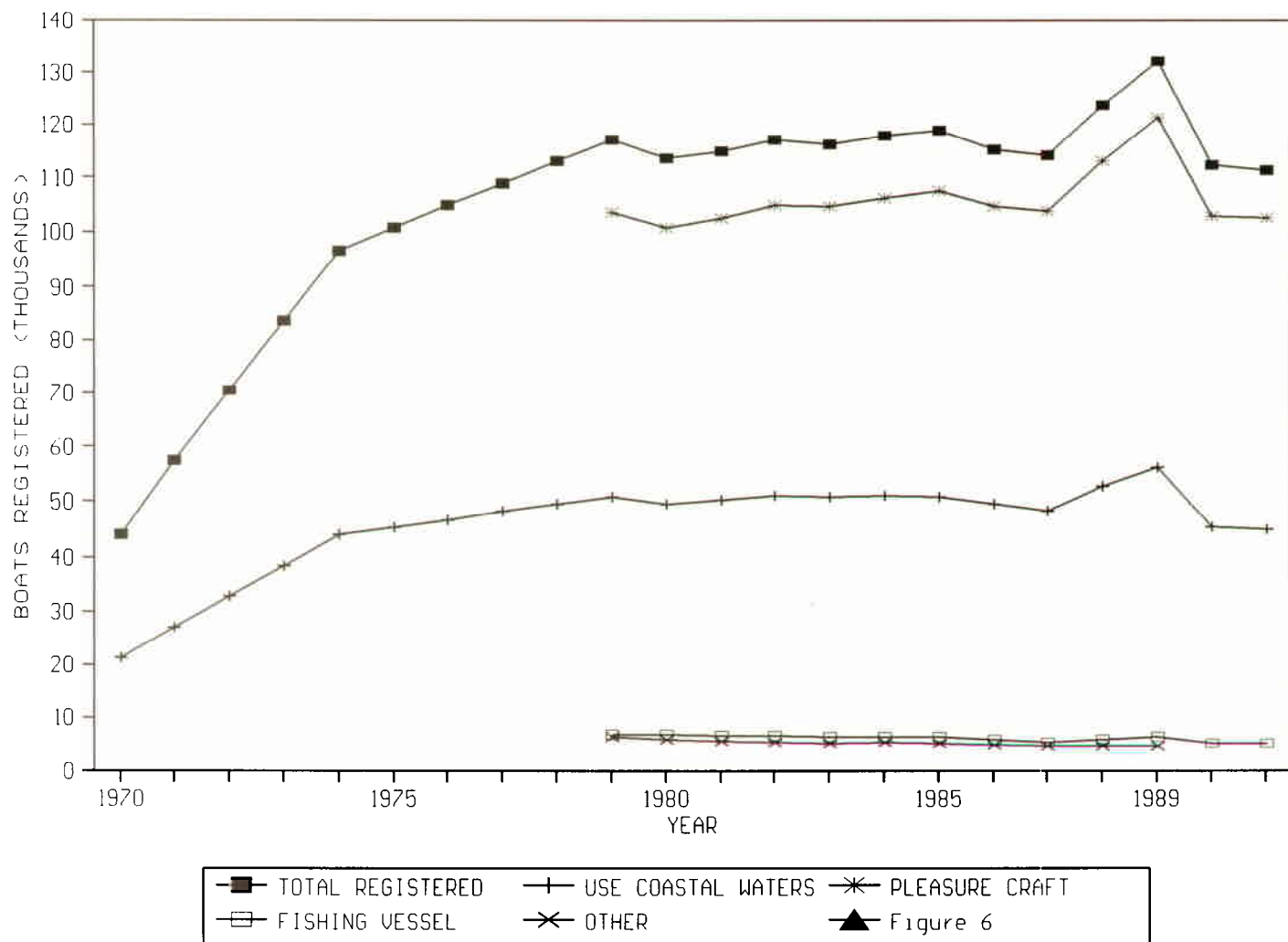
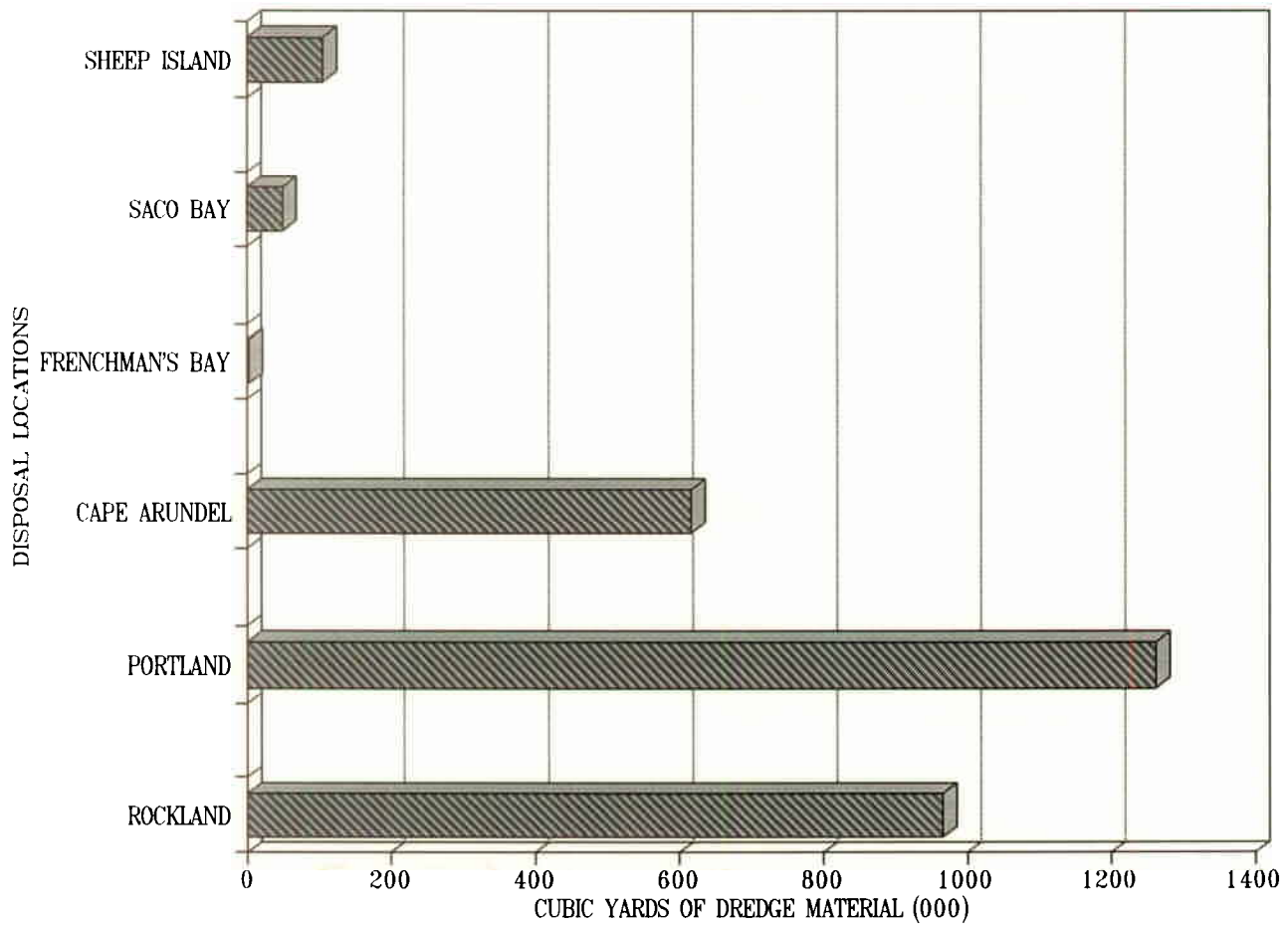


Figure 6



DREDGE MATERIAL DISPOSAL IN MAINE'S  
COASTAL WATERS (1982-1989)



**Figure 7**

phaseout of most of the existing systems. Forty-five industries are licensed to discharge wastewater to Maine's coastal watersheds. These industries include pulp and paper mills, tanneries, metal finishing operations, textile manufacturing, and chemical companies.

As population increases along the coast, greater volumes of wastewater will be discharged to tidal waters unless alternative systems are developed. With increased volume of automobile traffic and road and residential construction activities, increased volumes of surface waters will run-off to near-shore waters as well as increased loadings of pollutants associated with development and population growth. Recent mooring surveys indicate greater demand for moorings and use by recreational boaters. This trend is expected to continue.

***Marine Debris*** -- Plastic bottles, old lobster traps, pieces of net and rope, aluminum cans, and styrofoam chunks that accumulate on beaches and tidal waters are collectively referred to as marine debris. Marine debris includes any manufactured object of wood, plastic, glass, metal, cloth or other material that is disposed of in the marine environment, either purposefully or accidentally. More than just an unsightly mess or nuisance, marine debris can cause serious harm to the marine environment and appears to be a persistent and growing problem in Maine waters.

Marine debris degrades coastal habitats and endangers the health of marine and estuarine plants and animals. Marine debris resting on beaches, tidal flats, and submerged bottomlands covers and displaces the original vegetation and habitat. Plastics are of particular concern because plastic products float and persist in the marine environment for hundreds of years. Fish, birds, marine mammals (including seals and whales), and sea turtles, occasionally ingest or become entangled in plastic marine debris.

Active and abandoned fishing gear presents a hazard to marine wildlife. Lost traps, monofilament line, nets and other fishing gear may continue to entrap marine life for years after disappearing from the harvesters' care. Information on the number of 'ghost' traps and nets is unavailable and confined to anecdotal evidence. Regulations requiring degradable vents on lobster traps should reduce the numbers of ghost traps.

Marine debris in Maine has been informally surveyed through data collected as part of annual Coastal Cleanups since 1985. Coastal Cleanups are one-day trash collection events coordinated along the Maine coast each fall by the Maine Coastal Program. The results of the survey are approximate only, since data collection is not a rigorously controlled or scientific process. The cleanup totals for Maine are the best indication to date of the types of debris, sources of debris and volume of debris cluttering our coast.

In 1990, an estimated 29,850 pounds of trash was collected from 190 miles of beach, for an average 157.1 pounds per mile. Debris was collected all along the coast from urban harbors to remote island shores. According to previous Maine Coastal Cleanup results the volume of debris has not diminished with the yearly pickups--beaches scoured clean one year are littered with trash the next.

The major sources of marine debris in Maine are: boaters--recreational and commercial; sea-side visitors, including tourists, residents and recreational fishermen; run-off of surface waters (storm drains and CSOs); illegal direct dumping; and shipwrecks. Debris from foreign fishing and merchant vessels outside the Gulf of Maine does not appear to be a major problem on the Maine coast. The amount of debris from military operations and vessels is undocumented in Maine waters.

Plastics and styrofoam accounted for about 56 percent of the debris collected during the 1989 cleanup in Maine and about 60 percent during the 1990 cleanup. Styrofoam and polystyrene, used as flotation for docks, buoys, and floats, comprise a significant portion of the marine debris found on the Maine coast.

Oil cans, bleach bottles, beverage cans and bottles, styrofoam cups and plastic bags are examples of packaging debris often found on Maine shores. Packaging debris is left by recreational and commercial boaters and also by seaside visitors to beaches, parks and other public access points. An unknown amount of packaging debris washes off roads through combined sewer overflows and storm sewers during heavy rains. Coastal rivers transport trash from inland areas particularly during spring floods and storms.

Fishing and boating gear--nets, lobster traps, pieces of rope, rubber boots, plastic fish totes, and clamming gloves--account for approximately 9.6 percent of the marine debris collected during the 1989 cleanup in Maine. Commercial fishing, recreational fishing, and aquaculture activities account for most of this type of debris.

Maine Coastal Cleanup results indicate that marine debris continues to accumulate on Maine shores despite yearly removal, and that the volume of debris is increasing. Marine debris will continue to impact Maine waters as use of coastal waters and shorelands intensifies.

### Toxic Pollution

Heavy metals, pesticides, PCBs, and PAHs are all present in marine sediments in coastal waters. A recent scientific review concluded that

most Gulf of Maine sites sampled, even the deep central basins, exhibit elevated levels of several pollutants, and individual contaminant levels from Gulf of Maine sites often exceed levels reported from areas reputed to be severely stressed.<sup>67</sup>

In describing coastal trends in toxic pollution, the only safe conclusion is that arrived at by the Casco Bay Estuary Project for that water body:

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<sup>67</sup> Larsen, Peter F. "Marine Environmental Quality in the Gulf of Maine: A Review." Reviews in Aquatic Sciences. 6(1):67-87 (1992).

While it appears that toxic pollution levels have remained the same over the last decade, there are no data to determine over the long term if pollution is getting better, worse or staying the same<sup>68</sup>

One marine scientist predicts that an eventual outcome of toxic pollution research in Maine waters will be maximum toxic pollution levels set for shellfish, resulting in the likely closure of more shellfish beds than are currently shut down because of elevated pathogen levels. Considerably more research and monitoring will be necessary before such regulation can occur.<sup>69</sup>

### *E. Commercial Fishing*

The Gulf of Maine supports a significant commercial fishery for finfish and shellfish. In 1991, more than 192 million pounds of fish and shellfish valued at \$154 million were landed in Maine. Herring, lobster, cod, sea urchins, and menhaden dominated the total catch by weight. Lobster, cod, and sea urchin landings were worth the most, with lobsters representing nearly half the landed value of all of Maine's fisheries. These statistics do not include the more than 100 million pounds of menhaden, commonly known as pogies, sold to Canada and the former Soviet Union.

The 1990 and 1991 catch statistics are a reversal of a nine year downward trend in the amount of fish landed in Maine. Over the same eleven year time period the value of fish has sustained a relatively steady increase. However, in the rest of New England landed weight decreased in 1991. Maine's high landings can be attributed to an increase in the sea urchin harvest and a plentiful supply of codfish after a strong spawning year in 1987. Catches of herring and menhaden have also gone up, and more out-of-state fishing boats are landing their catch at the Portland Fish Exchange.

About 14,000 licenses were issued to commercial fishermen in the state of Maine, who harvest species from lobsters to shrimp to bloodworms to periwinkles. The number of licenses issued increased dramatically from 1950 to 1974, from just over 8,000 to just under 19,000 -- a 138 percent increase (Figure 8). The number of licenses has been declining steadily since that time, however, with a slight increase the last three years. Despite fewer licensed fishermen, greater effort is being expended to catch fewer fish. For example, there were 6,660 licensed lobster harvesters in 1960. Their numbers climbed to a peak of 10,500 in 1974 then decreased to 6,600 in 1990. Despite this trend, the number of lobster traps deployed in Maine's coastal waters has actually increased from roughly 700,000 in 1960 to more than two million in 1989.<sup>70</sup> Thus, while effort has increased substantially, the landings have remained relatively constant. In

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<sup>68</sup> Casco Bay Estuary Project, State of the Bay Report, 1992.

<sup>69</sup> John Sowles, Maine DEP, personal communication, July, 1992.

<sup>70</sup> Kenneth Sherman, Edward B. Cohen, Richard W. Langton, 1989. "The Northeast Continental Shelf: An Ecosystem at Risk," in The Gulf of Maine: Sustaining Our Common Heritage Conference Proceedings, ed., by Victor Konrad, et. al (Augusta: Maine State Planning Office). pg. 129.

## Licensed Commercial Harvesters in Maine

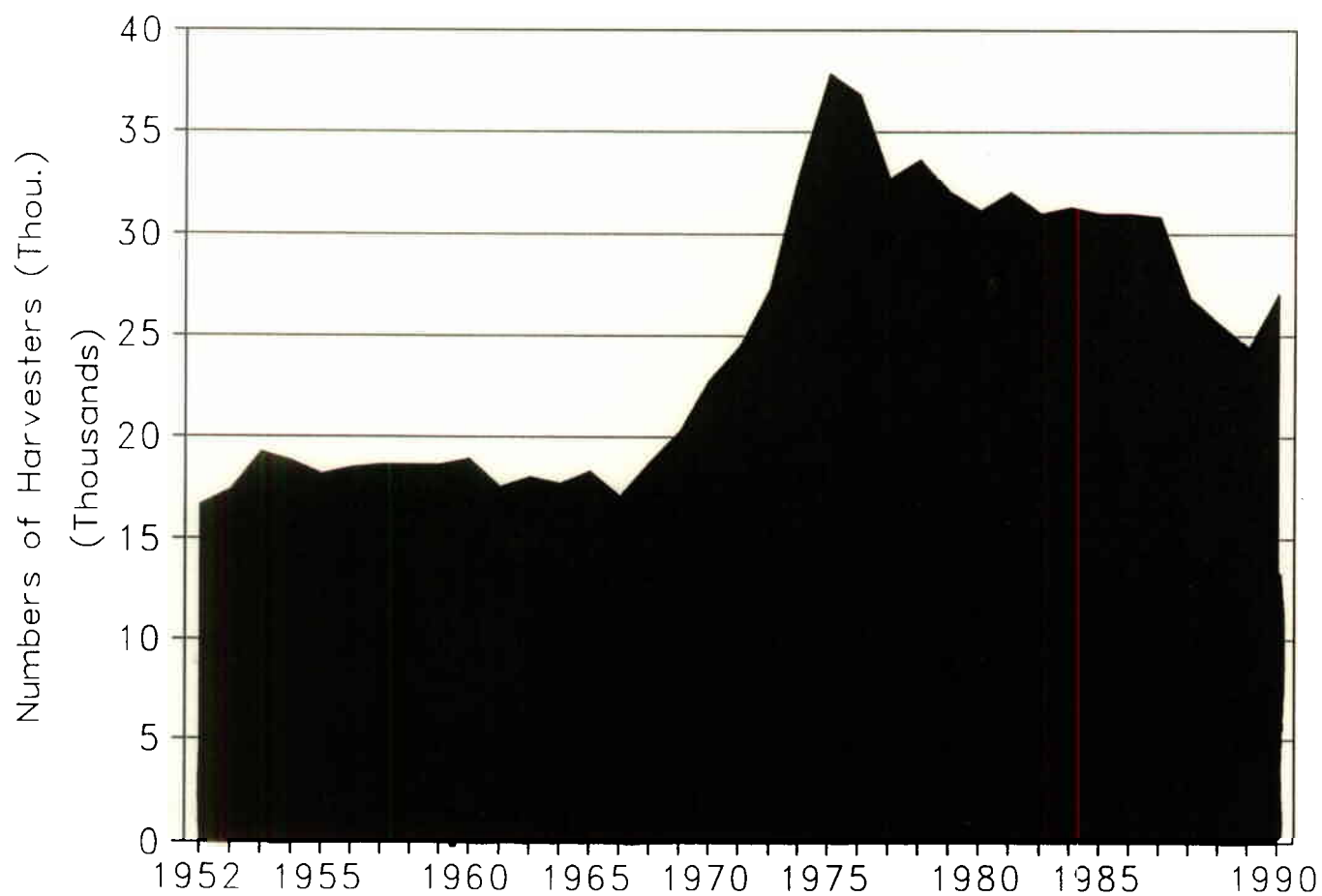


Figure 8

fact (Figure 9), in 1960 lobster landings were 24 million pounds and in 1991 landings were 31 million pounds.

Fish landings in Maine have increased during the last two years, however catch of some previously dominant species including haddock, ocean perch (redfish), and flounder, has declined significantly since 1980. Because of this decline, there is strong concern in the region that stocks of many species are dwindling to precariously low levels. For example, at the end of 1991, the National Marine Fisheries Service (NMFS) described the Gulf of Maine haddock stock as overexploited. NMFS statistics show that landings region-wide declined 95% between 1983 and 1990 and research survey catch has declined 84%, causing them to conclude there is little hope for recovery of the stock in the near future.<sup>71</sup>

The decline of the region's groundfish stocks is probably the result of a combination of factors including overfishing, habitat loss and alteration, pollution and climatic change. One interesting analysis by NMFS and DMR scientists, concluded that overfishing has drastically altered the relative abundance of fish in the Gulf of Maine and on Georges Bank. In the 1960s, surveys of fish stocks demonstrated that redfish and haddock were the most abundant species, comprising 28% and 12.2% of the weight per sampling tow. These two species were heavily targeted by fishermen. Abundance of these species declined in the 1980s to 7% for redfish and 4.8% for haddock. Meanwhile, dogfish rose to 23.2% and hake to 17.5% of the weight per tow.<sup>72</sup>

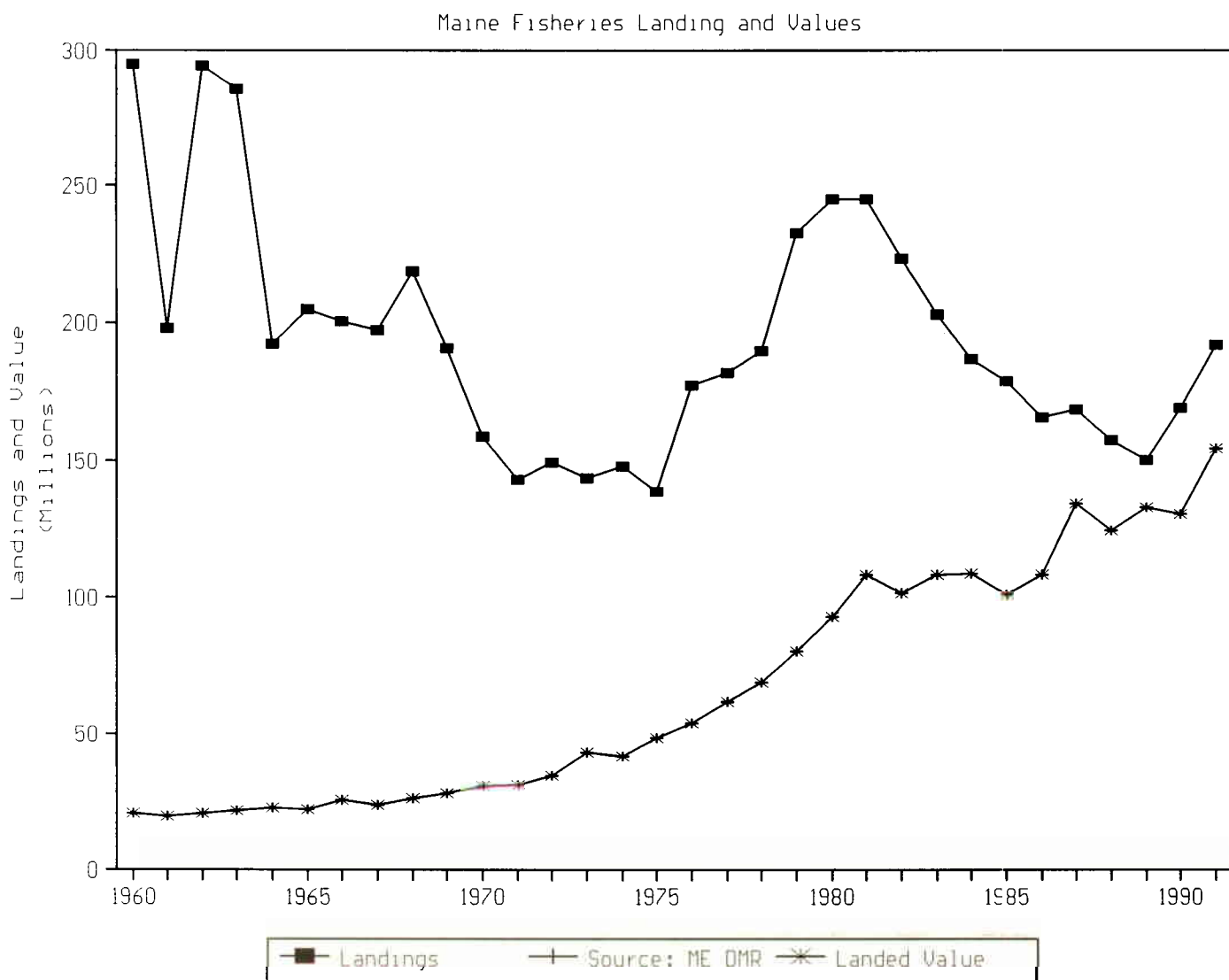
Softshell clams have always been a valuable component of Maine's annual fish landings, although the weight and value of the harvest has varied significantly over the last fifty years. Since 1982, clam landings have largely been in decline, with a drop in volume of 76% between that year and 1991. The harvest decrease has been the steepest in Washington, Hancock and Knox counties. A number of reasons have been posited for the successive poor harvests: poor clam sets, green crab predation, over-harvesting and flat closures due to bacterial contamination. Currently, 30% of Maine's flats are closed to shellfishing.

New fisheries have developed recently and their growth may have helped offset the economic impact of the decline of traditional fisheries. The most dramatic example is the sea urchin, harvested for its roe and exported to Japan. Landings climbed from 1.4 million pounds in 1987, with a landed value of \$236,000 to 20.5 million pounds in 1991, with a landed value of \$11 million. The rapid increase in landings is a concern both to industry members and state officials who fear urchins are being overharvested. In line with the actions of other urchin producing states, Maine's Department of Marine Resources is proposing regulations to protect this fishery.

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<sup>71</sup> Status of the Fishery Resources Off the Northeastern United States for 1991. NOAA Technical Memorandum NMFS-F/NEC-86, Sept. 1991, NMFS, Northeast Region, Northeast Fisheries Science Center, Woods Hole, MA.

<sup>72</sup> *ibid.*, p.135.



**Figure 9**



Two political events in the last 20 years profoundly affected Maine's commercial fishing industry. The first was the passage of the Magnuson Fishery Conservation and Management Act, which granted the United States jurisdiction over fishing within 200 miles of its shores. This act effectively eliminated foreign fishing fleets from the Gulf of Maine and spurred a tremendous expansion of the commercial offshore fleet -- as evidenced by the number of commercial fishing licenses and the amount of fish landed in Maine in the mid- to late- seventies. The law also set up regional fishery management councils around the country and charged them to develop management plans for most fisheries.

The second event was the 1984 World Court decision on the U.S./Canadian maritime boundary. This boundary effectively cut off valuable fishing grounds to Maine fishermen who had traditionally used these areas and has contributed to the decrease in landings in several species of finfish.<sup>73</sup>

Management of the fisheries, which has evolved over the years, is shared by federal, state and local government. Generally the goal of fisheries management is to assure the sustainability of fish stocks, usually by protecting spawning areas and juvenile fish and shellfish. Management measures include the regulation of fishing gear type, the areas or seasons where and when fishing is permitted, and size and amounts of fish or shellfish that can be harvested.

Large scale federal involvement in fisheries management began with passage of the Fisheries Management and Conservation Act in 1977, however some management measures have been in place for years. For example, for about fifty years Maine lobstermen have been cutting a v-notch into the tail of any egg bearing lobsters they catch and returning them to the ocean. Lobstermen are not allowed to land v-notched lobsters. This simple measure is intended to enhance lobster propagation.

Increasingly fishery management involves efforts to improve fish harvesting technology so that it selectively harvests the species and size of animal desired without damaging younger fish, other species, and bottom habitat. For example, lobster traps now have escape vents that allow the release of undersized lobsters and fastenings that degrade to allow lobsters to escape from traps lost on the ocean bottom. Shrimp fishermen from the New England states have been experimenting with alternative gear types that minimize the number of juvenile fish, especially flounder, that are caught and thereby killed.

The draft groundfish management plan released for comment by the New England Fisheries Management Council in early 1992 is probably the most important and controversial fisheries management action currently underway. The plan proposes limiting the number of days fishermen can fish and a number of measures to allow recovery of depleted stocks of cod, haddock, flounder and other groundfish in the Gulf of Maine and on Georges Bank.

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<sup>73</sup> The maritime boundary decision stopped 28 miles seaward of Machias Seal Island and thus failed to resolve the sovereignty of those waters, and of the island. The U.S. government maintains that this issue has been long settled and was therefore not an issue before the World Court.

## Use Conflicts

Despite, and perhaps because of, regulation of most fisheries at some level, conflicts between fisheries and between fishermen of the same fishery occur from time to time, and are exacerbated because over the years more fishermen with more gear are trying to catch fewer fish. During the summer of 1992, there were reports and subsequent arrests of lobstermen in Portland Harbor for cutting trap lines in a battle over territory. Farther off the coast during the same summer, there was a skirmish between dragger fishermen from Massachusetts and gillnetters from Stonington after gear was apparently damaged by a dragger. Similar conflicts occurred in preceding summers.

Commercial fisheries management will always be controversial because the success of a particular management scheme in sustaining fish stocks can never be certain, however it is certain to have a great impact on the way fishermen make a living. Ensuring the continued viability of the region's fishery resources will only become more challenging in the future.

### *F. Energy and Mineral Resources*

Over the years, there have been a number of proposals to explore for oil and gas in the Gulf of Maine/Georges Bank region. However, currently there is no active exploration for energy or mineral resources in Maine's coastal waters or the broader Gulf of Maine. In the late 1960s, the Maine Mining Bureau (predecessor to the Maine Geological Survey) granted oil and gas exploration rights off the Maine coast to King Resources.<sup>74</sup> The company was granted rights to a 3.33 million-acre area running roughly from Kennebunkport to Bar Harbor. At the closest point, the area was 11 miles off the coast, and 80 miles at its furthest.<sup>75</sup> However, the area proved not to be promising for development. In 1981 and 1982, five American companies drilled eight wells on Georges Bank, but discovered no economically exploitable quantities of oil or gas. However, industry interest in the region persists, but environmental concerns have indefinitely delayed any prospects for drilling on Georges Bank.

President Bush's recent announcement on the OCS oil and gas leasing program directed the Interior Department: to cancel the lease sale for the Georges Bank region (lease sale 96) and exclude it from the 1992-1997 five-year plan; conduct additional studies, including studies designed to determine the resource potential of the North Atlantic area and to assess the environmental, scientific, and technical considerations of development in the region; and to consult with the governors of the states whose residents would be affected by future development of oil and gas in the North Atlantic. The announcement stated also that no lease sale will be held until after

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<sup>74</sup> Resources from the Sea and Federal Limitations on State Control: Maine Law Affecting Marine Resources, Vol. Four. Report carried out under the joint sponsorship of: The School of Law of the University of Maine and the National Science Foundation, Office of Sea Grant Programs, 1970.

<sup>75</sup> While the state of Maine granted these exploration rights to King Resources in what are now considered federal waters, at the time, the state considered the continental shelf to be state territory, see, United States v. Maine, supra note 10.

the year 2000 and "then only if studies show that the development is warranted because of resource potential and is environmentally safe."<sup>76</sup>

The President's announcement is essentially consistent with state policy on OCS development. In prior policy statements, the state of Maine has recommended that the Gulf of Maine not be considered for oil and gas development and that only the most promising areas on Georges Bank should be offered for lease. Further, the state has advocated a cooperative arrangement between Canada and the U.S. to address joint planning and management of oil and gas resources on Georges Bank.<sup>77</sup>

Minerals other than oil and gas are of potential future interest in the Gulf of Maine. An intertidal mine located in Harborside on Cape Rosier in Penobscot Bay operated for a number of years in the late 1960s and 1970s and ceased production in 1977. Copper, lead, and zinc were taken from this mine. In the future, interest may turn to the large quantities of sand and gravel that lie on the seabed of the Gulf of Maine. The economic feasibility of developing these resources, however, has not been examined. The Maine Geological Survey is currently mapping the ocean bottom of Maine's coastal waters out to the 100-meter isobath. Other than the Harborside mine, no mining has occurred directly in the state's coastal waters but it is possible it will become economically feasible to exploit these resources at some future time. As land deposits are depleted and the demand for these resources continues, the state may be forced to look to the sea as a source of sand and gravel and other minerals. This is, in fact, already the case in several locations; nearshore sand and gravel mining occurs off the New York coast, gold is mined in Alaska's coastal waters, and industry has expressed interest in the sand and gravel deposits offshore Massachusetts in the Gulf of Maine. Staff of the New England Governors' Conference are currently synthesizing information for all of New England on the amount and availability of sand and gravel in both terrestrial and ocean bottom locations.<sup>78</sup> Future demand for sand and gravel in large public works projects could well make mining of submerged deposits likely.

### Use Conflict

The Maine Geological Survey has identified a possible commercial fisheries concern should mining of submerged sand and gravel beds occur: scallop dragging is done on these same deposits, and mining represents a clear conflict with this fishery harvest.

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<sup>76</sup> The White House, Office of the Press Secretary, Fact Sheet: Presidential Decisions Concerning Oil and Gas Development on the Outer Continental Shelf, June 26, 1990.

<sup>77</sup> Letter from Governor John R. McKernan, Jr. to Secretary of Interior Manuel Lujan, Jr. on the Department of the Interior's Draft Proposed Comprehensive Outer Continental Shelf Natural Gas and Oil Resource Management Program for 1992-1997.

<sup>78</sup> Steve Dickson, Maine Geological Survey, personal communication, July, 1992.

### G. Protected Marine Species

While clearly not a "use" in the same sense as those described above, several species of marine wildlife are afforded special protection by state and federal law and thus affect the manner in which other uses may operate.

These species include marine mammals, endangered and threatened species of seabirds and shorebirds and other coastal wildlife (see Box 1 for list of species). As the list indicates, seabirds, shorebirds and marine mammals dominate the list of protected coastal and marine wildlife. This, however, may be due to the lack of information on marine organisms than the fact that few are endangered or threatened.

One trend connects Maine coastal species considered endangered, threatened or warranting special attention: all require active management, or their populations will decline in the future. There are three continuing use conflicts these birds and mammals face, listed in order of magnitude. Habitat loss results from continuing coastal development and new uses for inshore waters such as aquaculture. Human disturbance occurs on beaches where it effects nesting and feeding birds and in nearshore waters where small boat traffic causes abandonment of critical sites for nesting, roosting and migrating birds. Toxics in the coastal marine environment contaminate food sources causing low hatching rates and high mortality rates in some birds. Migratory shore birds are

#### Marine and Coastal Species of Special Significance in Maine's Coastal Waters

##### I. Endangered Species (species in immediate danger of extermination)

Bald Eagle	Peregrine Falcon	Piping Plover
Least Tern	Roseate Tern	Sperm Whale
Sei Whale	Right Whale	Finback Whale
Humpback Whale	Short-nose Sturgeon	Leatherback Turtle
Atlantic Ridley Turtle		

##### II. Threatened Species (species that will become endangered if current populations experience further decline)

Loggerhead Turtle

##### III. Watch List (species that warrant special attention)

Leach's Storm-Petrel	Snowy Egret	Little Blue Heron
Tricolored Heron	Glossy Ibis	Ruddy Turnstone
Whimbrel	Lesser Yellowlegs	Black-bellied Plover
Sanderling	Bonaparte's Gull	Black Tern
Razorbill	Atlantic Puffin	Least Sandpiper
Dunlin	White-rumped Sandpiper	
Semipalmated Plover	Semipalmated Sandpiper	
Red-necked Phalarope		

##### IV. Protected Marine Mammal Species (In addition to those marine mammals listed above, the following are protected under federal law)

Gray Seal	Harbor Seal	Harp Seal
Hooded Seal	Harbor Porpoise	Pilot Whale
White-Sided Dolphin	White-beaked Dolphin	
Bottle-Nose Dolphin	Killer Whale	

(sources: Maine Department of Inland Fisheries and Wildlife and Katona et. al, Whales, Porpoises, and Seals of the Gulf of Maine and Eastern Canada)

#### Box 1

frequently subject to a doubleedged sword: loss of habitat in part of their range and contaminated food sources elsewhere.<sup>79</sup>

### Harbor Porpoise

In September 1991, the National Marine Fisheries Service (NMFS) announced that it would review the status of the harbor porpoise population, a species commonly found in Maine's coastal waters. The status review will determine if the species should be designated as "depleted" (below its optimum sustainable population level) under the federal Marine Mammal Protection Act and/or added to the List of Threatened and Endangered Species under the federal Endangered Species Act.<sup>80</sup> A recent fisheries workshop suggests that the species may warrant listing. With an estimated population of 45,000 in the Gulf of Maine & Bay of Fundy, the harbor porpoise's primary threat is the sink gillnet fishery. 1991 by-catch from the Gulf of Maine fishery was estimated to be 4% of the total harbor porpoise population and does not include by-catch from other U.S. and Canadian fisheries. Believing this by-catch to be too high, fisheries scientists have urged its reduction, either through temporary closure of ocean areas to fishing or gear modification.<sup>81</sup> NMFS may release its finding this fall and it could have far reaching consequences for a segment of Maine's commercial fishing industry.<sup>82</sup>

The state of the harbor porpoise population in the Gulf of Maine is revealing of multiple use conflicts affecting a protected marine mammal species. Other observed use conflicts, aquaculture and boating, look to result in physical habitat reduction for harbor porpoises.

The increased number of salmon aquaculture operations in the sheltered bays and coves in the southwest Bay of Fundy has coincided with the observed disappearance of harbor porpoise from these areas. The greatest problem may be vessel traffic, since the number of boats in the Gulf of Maine has increased dramatically and harbor porpoise have been observed to avoid boats. The small sheltered bays in the Gulf of Maine where calving or nursing may occur are probably experiencing similar increases in boat traffic. The difference between vessel avoidance behavior and area avoidance by harbor porpoise, due to boat traffic was noted. Also, the amount of time spent avoiding boats is important, since foraging time may be reduced. Small, high-speed vessels are possibly of greater concern than larger vessels, except in situations where large commercial ships may physically displace animals from small sheltered bays.<sup>83</sup>

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<sup>79</sup> Stuart Fefer, Fish and Wildlife Service, Alan Hutchinson, Maine Inland Fish and Wildlife, personal communication, July, 1992.

<sup>80</sup> 56 Federal Register 5684, February 12, 1991.

<sup>81</sup> NOAA/National Marine Fisheries Service, Harbor Porpoise in Eastern North America: Status and Research Needs, July, 1992.

<sup>82</sup> In a parallel effort, the National Marine Fisheries Service is proposing significant changes to the Marine Mammal Protection Act which could lead to further restrictions on commercial gill-net fishing and perhaps shut down the fishery.

<sup>83</sup> *ibid.*, pp. 18-19.



## Northern Right Whale

Another example of a protected marine species is the northern right whale. While not known to inhabit Maine's coastal waters to any great extent, the species does inhabit numerous areas of the Gulf of Maine. The precarious population level of this animal, only about 350 remain in the western North Atlantic, demands strict protection. A special advisory group to the National Marine Fisheries Service has recommended numerous actions to protect the northern right whale including implementing appropriate controls on ship operations and design to reduce collisions with the whales, reduce or eliminate injury and mortality caused by fisheries and fishing gear, and protecting habitats essential to the survival and recovery of the northern right whale.<sup>84</sup>

### *H. Other Marine Resource Industries and Trends*

#### Boatbuilding

Boatbuilding in Maine is supported by commercial fishing, marine transportation and recreational fishing and boating, all of which occur in its waters. Indeed, boatbuilding is a good indicator of the strength of these coastal industries. The Maine Marine Trades Association has documented the loss of six hundred jobs in the state's boatbuilding industry brought on by the national recession.<sup>85</sup> Among both builders of work boats and pleasure boats, business is extremely slow with many companies existing from order to order. Fishing boat operators, for instance, are awaiting the release of a groundfish management plan before considering new boats. Pleasure sail and power boat builders are producing far fewer boats, but larger ones, for those who didn't lose money in the recession. Boatbuilders are surviving, however, because the industry here has always done custom or semi-custom building with a steady customer base, unlike the mass production builders in the Southeast. The thrust of the boatbuilding business has changed, as well. Indications are that boat maintenance will be a bigger part of the trade in this decade, and many boatbuilders are repositioning themselves to handle refurbishing, repair and maintenance of the thousands of boats built during the 1980s.<sup>86</sup>

#### Shipbuilding

Maine has a long heritage of shipbuilding. Schooners, barques and other ships were built along Maine's coastline for fishing and trade. Today, shipbuilding continues to be a major industry in the state with large firms such as Bath Iron Works (BIW) and Portsmouth Naval Shipyard. As noted earlier in this report, the shipbuilding industry will be facing changes as a result of decreasing defense dollars. Smaller yards, such as Washburn and Doughty in East Boothbay, continue to build vessels for the fishing and transportation sectors.

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<sup>84</sup> Right Whale Recovery Team, Draft National Recovery Plan for the Northern Right Whale, National Oceanic and Atmospheric Administration, February, 1990.

<sup>85</sup> Jim Chandler, Maine Marine Trades Association, personal communication, July, 1992.

<sup>86</sup> Steven Rappaport, reporter, The Ellsworth American, personal communication, June, 1992.

## Use Conflicts

Possible conflicts from shipbuilding is primarily from runoff and other by-products from the shipbuilding process. Toxic pollutants in the runoff can destroy sensitive marine habitats such as shellfish areas.

## Seaweed Harvesting

Washington County is the nucleus of several small businesses who are preparing and marketing seaweeds harvested in coastal waters. A company located in Franklin is preeminent, doing a half million dollar business yearly selling seaweeds to natural foods stores in the U.S., Europe and Malaysia. The seaweeds harvested are dulce, kelp, alaria and wild nori and they are eaten raw or in salads. The industry's marketing goal is to make seaweed a mainstream vegetable product available in supermarket produce departments. Interest is increasing in this consumer use for seaweed. One company reports inquiries from Newfoundland and Nova Scotia, where provincial officials are searching for new marine resource industries in the wake of the collapsed cod fishery.<sup>87</sup>

A venture related to wild seaweed harvest is underway in Eastport. There, a company is beginning nori aquaculture, a practice common in Japan for years. The cultivated nori, of a higher quality than that harvested on the coast, is being grown in close proximity to salmon net pens on the waste nutrients from the pens. The effort remains experimental, with a first crop to be harvested in September. If successful here, Maine grown nori has great market potential. Imported, cultured nori is currently a thirty million dollar market nationally, a two billion dollar market worldwide.

## Use Conflicts

Seaweed harvest is sometimes affected by commercial fishing activities. Kelp is harvested from beds at low tide in shallow bays. Scallop dragging can ruin kelp beds and reduce the number of spores available to re-establish beds. Water quality is a special concern of the business, given that the product is sold in natural foods stores. Marketers test all the seaweed for a variety of toxics, and a decline in coastal water quality would seriously hurt the industry. Seaweed harvesters and growers remain as anxious as commercial fishermen and aquaculturists about the potential for oil spills in Maine waters and its effect on their livelihood.

### *I. Current Coastal Issues in Communities*

The uses of coastal waters and existing conflicts between uses reported on above are mostly from the perspective of business and government. There is a third interest group with an important, local view of coastal concerns: Maine communities. Cities and towns generally see these problems from the land side--as coastal land use planning issues--and are most concerned with uses and resources within their boundaries. To get an overview of the issues communities

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<sup>87</sup> Shepard Ekhart, president, Maine Coast Sea Vegetables, personal communication, August, 1992.



identify as concerns, 27 comprehensive plans prepared by coastal communities during 1990-1991 were reviewed. The plans represent a good cross section of towns--from Eliot to Steuben--representing every coastal region of Maine.

As is evident from the graph (Figure 10), **marine resources** are of greatest concern. Towns see reopening shellfish beds as an economic development issue, an important source of jobs in a depressed economy. While **water quality** was not as highly ranked, most communities understand that the two issues are linked and that improved water quality is often the key to a restored shellfish industry. **Public access** remains a significant issue. Some towns want to increase access for recreational activities--fishing, hiking, swimming, boating. Other communities are anxious about diminished access, parking and loading space for commercial waterfront users such as commercial fishermen and clambers.

The problem of access is tied closely to **port and harbor management**, which ranked third as a community concern. Some towns find their harbors at mooring capacity with continuing demand, other towns seek mooring realignments. Many are concerned about wharf and landing access from the water side for commercial users. Increasingly, recreational use is dominating ports and harbors, threatening the ability of commercial fishermen to operate easily in their home ports. Preservation of **water dependant uses** for waterfront property looks less urgent to towns now that it did in the late 1980s. As pressures reemerge on coastal real estate later in the decade, this issue will again become prominent. Finally, the need for **regional coordination** or interlocal cooperation among towns to solve water quality and marine resource problems did not rank high. However, almost a third of the communities did acknowledge the need to work with adjoining towns to address common problems. This realization is likely to be a growing trend in town land use planning.<sup>88</sup>

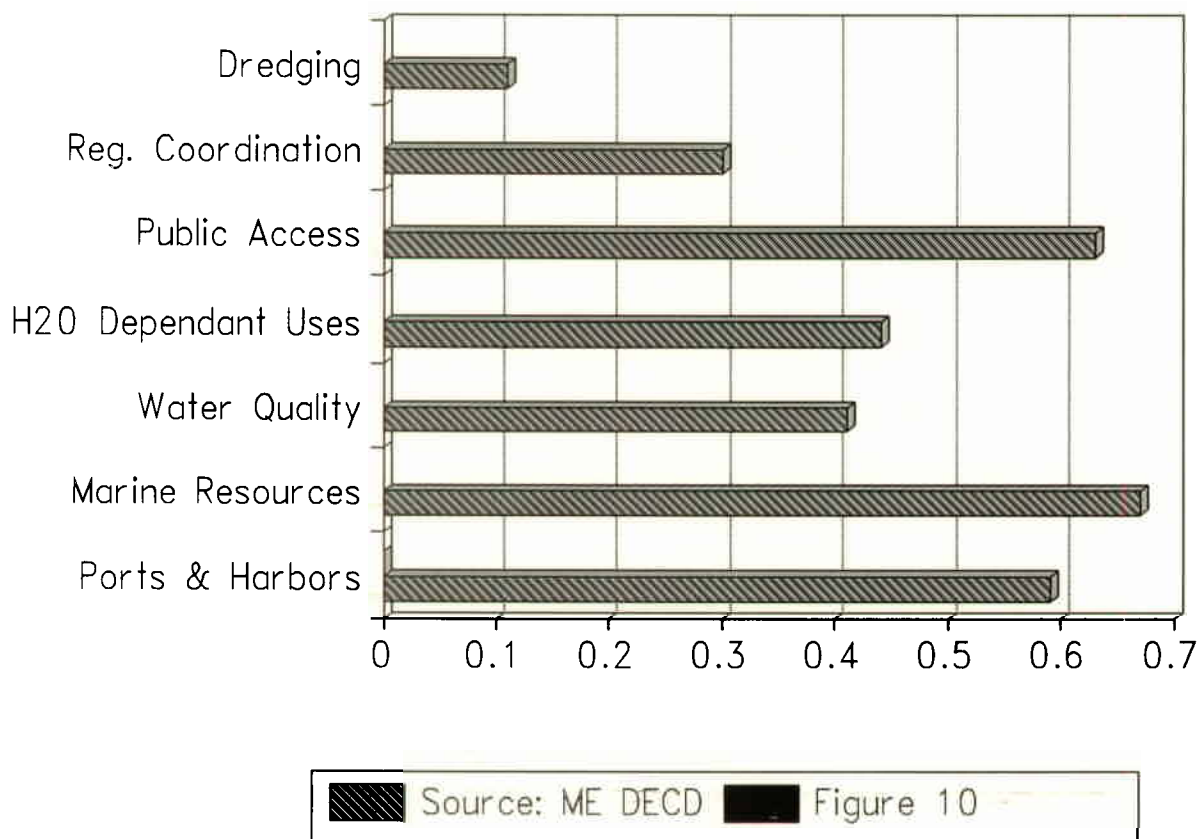
All of the issues noted above are entwined with recreational and commercial use conflicts in the coastal and marine environment. Knowing the set of problems which most concern coastal citizens should help in setting priorities among use conflict issues to be addressed.

In general, the amount and variety of activity in Maine's coastal waters changed substantially over the past 15 years. Salmon aquaculture, recreational boating and cruise ships come immediately to mind as examples of Maine's changing marine uses. It bodes well for the economy that new opportunities have presented themselves. However, these changes also necessitate a greater degree of management on the part of the state. If not properly managed, these increased and varied uses can conflict with each other and cause damage to the marine environment. As Maine looks to the future, the ocean and its resources will continue to provide a wealth of economically sustainable opportunities provided that state government and the users can meet the challenge of preserving the long-term viability of the marine environment. The next section will review briefly the state and federal governments' role in managing the uses of the state's marine waters.

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<sup>88</sup> Conversations with staff at Maine's six regional planning commissions serving coastal communities confirm the finding that marine resources/water quality, public access/recreational vs. commercial use and port & harbor management are currently issues of special importance to coastal towns.

## Coastal Issues in Maine Communities noted in comprehensive plans 1990–1991



**Figure 10**

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### **III. GOVERNMENT ORGANIZATION AND THE MARINE ENVIRONMENT**

In attempting to develop options and recommendations for improving the management of Maine's marine waters, it is important to inventory state agencies that have a role in policy, planning, or managing the marine environment. In Maine over 400 agencies, boards, and commissions have been created by the legislative or executive branches of government. Of these, approximately 28 agencies spread across 10 departments have a role in the marine environment. In addition, there are 16 federal agencies which affect the way we do business in the marine environment in Maine. This chapter provides a brief survey of the major state agencies and a summary of federal agencies that have a role in managing the uses and values of Maine's marine waters.<sup>89</sup> A brief survey of local government authority in the marine environment is also provided.

#### ***A. State Agencies***

##### **Department of Marine Resources**

The Department of Marine Resources is the only cabinet-level department whose sole responsibility concerns the marine environment. The department was established to conserve and develop the state's marine and estuarine resources<sup>90</sup> by conducting and sponsoring scientific research, promoting and developing the Maine commercial fishing industry, advising and cooperating with other government agencies concerning development or activity in coastal waters and by implementing, administering and enforcing the marine resource laws of the state.

The department is headed by a commissioner, who is appointed by the Governor and approved by the Legislature. By statute the department is authorized to:

- enter into reciprocal enforcement agreements with other states, interstate regional authorities and the federal government;
- advise state and federal agencies on the ecological effects of dredging and filling, as well as other activities which affect coastal wetlands;
- cooperate, consult and advise other appropriate state agencies on all interrelated matters involving the coast and its marine resources;
- assist the fishing industry in the promotion and marketing of its products;
- close contaminated shores, waters, and flats to shellfish harvesting;

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<sup>89</sup> The Maine State Government Annual Report, 1988-89 provided much of the information found in this chapter.

<sup>90</sup> "Marine resources" is defined in statute as "...all renewable marine organisms and the entire ecology and habitat supporting those organisms." 12 MRSA sec. 6001(27)

- make regulations to assure the conservation of renewable marine resources in any coastal waters or flats of the state; and
- lease areas in, on and under the coastal waters, including the public lands beneath those waters and portions of the intertidal zone, for aquaculture of marine organisms.

The department is comprised of the Bureaus of Marine Science, Marine Development, Marine Patrol, Administration, the Marine Resources Advisory Council, and the Lobster Advisory Council. The Marine Resources Advisory Council, consisting of members from different segments of the commercial fishing industry, provides advice to the commissioner on policy matters affecting the fishing industry. In addition, the council is required to provide its advice and consent to all regulations proposed by the commissioner. The Lobster Advisory Council advises the commissioner on activities of the department which relate to the lobster industry, investigates problems, and makes recommendations to the commissioner and the Marine Resources Advisory Council concerning its investigations and on lobster research plans.

### Department of Environmental Protection

The Department of Environmental Protection is the major environmental regulator of the state. It implements numerous statutes designed to prevent damage to the environment from pollution and development. The department directs programs concerning air and water pollution, solid and hazardous waste, dredge and fill of coastal wetlands and land use. Its major functions with respect to the marine environment are environmental review and permitting of aquaculture leasing, submerged land leasing, dredge and fill activities, and dredge spoil disposal, water quality classification, oil terminal licensing, oil spill response, planning for nonpoint source pollution control, coastal wetlands regulation, oversight of shoreland zoning and marine pollution monitoring.

The department is divided into four major substantive bureaus: the Bureaus of Air, Land, and Water Quality Control, and Hazardous Materials and Solid Waste Control; and the Board of Environmental Protection. The purpose of the Board, which consists of ten members appointed by the Governor, is to control, abate and prevent pollution of the air, land and waters of the state and to prevent the diminution of the highest and best use of the natural environment of the state. The board holds public hearings, issues permits, promulgates regulations and serves as an appeals body when applicants object to departmentally issued permits.

A relatively new marine-related program for the DEP is the Casco Bay Estuary Project which was established to protect and enhance the water quality of the bay. The Casco Bay Management Committee, supported by three advisory committees, is responsible for preparing a comprehensive conservation and management plan, developing a public education program and funding research in the bay. The committee consists of one representative each from the departments of Environmental Protection, Marine Resources and Economic and Community Development, the State Planning Office and EPA, and three representatives each from the citizen advisory committee, technical advisory committee, and local government advisory committee. The Department of Environmental Protection chairs of the Management Committee.

Resulting from recommendations made by the Commission to Study Maine's Oil Spill Clean-up Preparedness (1990-1992), DEP has increased responsibilities for marine oil spill planning and response efforts. In particular, these responsibilities include development of a Marine Oil Spill Contingency Plan which describes the State's response to oil spills by establishing requirements and procedures for the discovery, notification, assessment of and response to releases and threats of release of oil. The Plan also establishes roles and responsibilities of DEP, other governmental agencies, potentially responsible parties and the public. Assisting DEP in oil spill planning is the Oil Spill Advisory Committee, created by the Commission.

### Department of Conservation

The Department of Conservation is the major state landowner and trustee for publicly-owned lands. The department was established to preserve, protect and enhance the land and water resources of the state; to encourage the wise use of the state's scenic, mineral and forest resources; to ensure coordinated planning for the future allocation of lands for recreational, forest production, mining and other public and private uses; and to provide for the effective management of public lands. Bureaus with significant marine-related responsibilities in the department include the Maine Geological Survey and the Bureau of Public Lands.

The *Maine Geological Survey* (MGS) was established to map, interpret and publish geologic information, provide advisory assistance to the minerals industry, and interpretive information for planning and regulatory agencies. Its major marine-related responsibilities include marine geological research in the Gulf of Maine, mapping of mineral resources off the coast of Maine, and provision of technical services to other state agencies involved in the coastal zone, including technical review of dredge and fill permits, coastal sand dune activities, and other submerged lands activities. MGS also has regulatory jurisdiction over mineral mining (other than sand and gravel) on state lands, including submerged lands to the three-mile limit of state jurisdiction.

The *Bureau of Public Lands* (BPL) is responsible for the management and administration of Maine's 3.5 million acres of offshore submerged lands and some 1,500 state-owned islands. The agency's jurisdiction in the marine environment is from the low-water mark to the three-mile limit of the state's jurisdiction. The goal of the bureau with respect to submerged lands is to fulfill its obligation as steward of the public trust and provide the greatest long-term benefits for the people of the state. The bureau is authorized to issue leases or easements to private individuals for the use of the submerged lands for the purposes of dredging, filling, erecting structures and installation of cables and pipelines. As noted earlier, BPL does not issue leases for aquaculture, which is the responsibility of DMR. Because the bureau is the state agency which implements the public trust doctrine, the bureau reviews lease applications on the basis of their effect on the public trust rights of fishing, fowling, and navigation.<sup>91</sup>

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<sup>91</sup> 12 MRSA 558-A. The state Submerged Lands Act authorizes the Bureau of Public Lands to deny the right to lease submerged lands if it is determined "that the lease will unreasonably interfere with customary or traditional public access ways to, or public trust rights in, on or over the intertidal or submerged lands and the

## Department of Transportation

The purpose of the Department of Transportation is to plan and develop adequate, safe and efficient transportation facilities and services which will contribute to the economic growth of the state and the well-being of its people. The primary responsibilities of the department are to develop comprehensive, balanced plans and policies to meet present and future needs for adequate, safe and efficient transportation facilities in the state. The department also assists in the development, operation and maintenance of services and facilities and stimulates active support for, and develops, administers and promotes transportation safety actions throughout the state.

With respect to the marine environment, the department acquires, constructs, operates and maintains harbor facilities to support the development of coastal resources, ports and harbors. It also operates and maintains port and water transportation facilities. Marine-related divisions within DOT include the Maine State Ferry Advisory Board, the Division of Ports and Marine Transportation within the Bureau of Transportation Services and the Maine Port Authority. The *Maine State Ferry Advisory Board*, consisting of one person from each of the island municipalities served by the ferry system and three members appointed by the Commissioner of Transportation, advises the department on matters relating to the State Ferry Service.

The *Maine Port Authority* was established to initiate and implement programs which will encourage and assist in the development, expansion and utilization of ports and port facilities in the state. The authority is authorized to acquire, construct and operate piers and terminal facilities within the state through proceeds of the sale of revenue bonds; and to conduct other allied activities in connection with port development. The Port Authority consists of a five-member board of directors, who broadly represent the coastal areas of the state. Four of the directors are appointed by the Governor and the fifth is the Commissioner of Transportation who also serves as the chair of the authority.

The *Ports and Marine Transportation Division* undertakes and directs planning studies on the development and improvement of cargo handling facilities at Maine ports, assist with the operations of the Portland Fish Pier, performs mandated safety inspections, maintains the Casco Bay Island Transit District, oversees the State Ferry Service. The division also markets Maine ports and undertakes a continuing analysis of Maine port traffic, pier and wharf construction, and cruise ship activities.

## Department of Inland Fisheries and Wildlife

The Department of Inland Fisheries and Wildlife was established to ensure that all species of wildlife and aquatic resources in the state are maintained and perpetuated for their intrinsic and ecological values, for their economic contribution and for their recreational, scientific, and educational value. In addition, the department is responsible for the establishment and enforcement of rules and regulations governing recreational inland fishing, hunting, and trapping, propagation and stocking of fish, acquisition of wildlife management areas, the registration of recreational vehicles and the issuing of licenses and permits.

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waters above those lands."



As the name of the department implies, the focus of its efforts is on terrestrial wildlife and freshwater fisheries. However, the department does have several coastal/marine-related responsibilities. These include the registration of watercraft, inventories and management of significant wildlife habitats, including seabird and marine mammal habitats, protection of and research on endangered and threatened wildlife, including bald eagles, and environmental assessment and review of proposed coastal development projects. The department also manages the inland freshwater habitats of anadromous and catadromous fish. The Commissioner of Inland Fisheries and Wildlife also serves as chair of the Atlantic Sea Run Salmon Commission. The commission, which is composed of the Commissioner, the Commissioner of Marine Resources and three members appointed by the Governor, promulgates rules and regulations governing the management of Atlantic salmon in both inland and tidal waters of the state.

### Executive Department

Relevant units within the Executive Department that have marine-related responsibilities include the State Planning Office (specifically the Maine Coastal Program), Land and Water Resources Council and the Marine Research Board. The primary responsibilities of the State Planning Office are:

- to provide assistance to the Governor and Legislature in identifying long-range goals and policies for the state;
- to coordinate the preparation and revision of development and conservation goals for the state;
- to conduct continuing analyses and assessment of the economy and natural resources of Maine in order to assist the executive and legislative branches of government in developing economic and natural resource goals and policies; and
- to undertake planning programs that cut across responsibilities of line agencies and to act as a coordinating agency.

The mission of the State Planning Office is: (i) to meet in a timely fashion the requests of the Governor, executive agencies and the Legislature for information, economic analysis, and policy recommendations on issues of immediate concern; (ii) to conduct in-depth studies on issues of long-range significance for the socio-economic and natural resource development of the state and to formulate policy recommendations for state decision makers; and (iii) to maintain current information on development plans and on state and federal development assistance programs and local development efforts. The Office also administers the Land for Maine's Future Program, Maine Critical Areas Program, and the Maine Coastal Program.

The *Maine Coastal Program* (MCP) was established in response to the Federal Coastal Zone Management Act of 1972. The MCP is a "networked program" consisting of projects and activities designed to achieve a balance between the conservation of coastal resources and their wise utilization for the economic benefit of the state. The program provides funds to several state agencies and local governments to address various coastal issues. Local governments use

these grants to support projects related to local land-use issues (e.g. shoreland protection and land use ordinances), economic development (e.g. ports, harbors, waterfronts and fish piers), recreation and access (e.g. park development) and marine resources management (e.g. shellfish management surveys and clam warden programs).

The *Land and Water Resources Council* was established to advise the Governor, the Legislature and state agencies on the development of comprehensive, integrated land and water resources planning and management programs for the state. The director of the State Planning Office serves as chair of the Council, which consists of the commissioners of all natural resource-related departments, a representative of the university system and the Chair of the Regional Planning Commissions Directors' Association. The major purposes of the Council are to encourage inter-agency coordination of land and water resource programs, recommend coordinated state policies for major proposals that transcend the concerns of any one agency, and seek cooperation of federal agencies to assure that their programs are in the best interest of the state. The Council recently established six standing committees to carry out the policy development work of the council. Included among these is a Marine Policy Committee, chaired by the Commissioner of Marine Resources. The committee, which consists of representatives from all state agencies with marine-related responsibilities, is charged with coordinating state marine policy, raising issues of concern, and developing policy in areas where deficiencies are found.

The *Marine Research Board*, which is administratively a component of the Maine Science and Technology Commission, consists of a broad spectrum of marine interests from throughout the state, the Commissioners of Environmental Protection and Marine Resources, and the directors of the State Planning Office and the Maine Geological Survey. The purpose of the board is to develop a biennial priority statement and action plan of marine research needs of the state. The purpose of the plan is to guide funding recommendations and activities of the board. In addition, the board is authorized to develop and administer a competitive, merit-based grant program to address marine research needs of the state.

#### Department of *Economic and Community Development*

The Department of Economic and Community Development is responsible for business attraction and assistance, tourism development and management, community development, and comprehensive land-use planning. The unit of DECD with the most impact on marine issues is the Office of Comprehensive Planning (OCP). OCP is responsible for implementing and administering Maine's recently enacted Growth Management Program, which requires the department to review and certify local comprehensive plans, and to provide a wide range of technical assistance to local governments. The office also provides technical assistance and funding to coastal communities for the preparation and administration of local land use ordinances, public access planning and harbor management.

#### Maine State Pilotage Commission

The Maine State Pilotage Commission was established to provide a system of state pilotage devoted to the preservation and protection of lives, property and vessels entering or leaving the coastal waters of the state. The primary responsibilities of the commission are to

establish and determine qualifications and conduct examinations for pilots in all coastal waters of Maine (except Portland Harbor which is covered by the Board of Harbor Commissioners for Portland Harbor), to issue and renew licenses, and suspend or revoke any pilot's license as necessary. The commission is composed of five members appointed by the Governor, three of whom must be licensed pilots, one representing the marine industry and one with a marine background who represents the public.

#### Finance Authority of Maine

The Finance Authority of Maine was created to assist business development and to create new employment opportunities throughout the state. The Authority accomplishes its goals through a wide variety of programs, ranging from traditional loan insurance for both small and larger Maine businesses, to project grants for research and technological innovation. FAME receives limited funding from the legislature and receives most of its operating funds from mortgage insurance fees, service and applications fees charged in connection with bonds, as well as insurance premiums and fees generated from other financial assistance offered by the authority. The authority is overseen by a thirteen-member board of directors from both within and outside state government.

Two components of FAME are most relevant to the marine environment: the Natural Resources Division; and the Overboard Discharge Replacement Program. The Natural Resources Division works to insure that affordable capital and other types of financial assistance are readily available to natural resource-based businesses, including fisheries-related businesses. The division supports such projects as investments in piers, docks, seafood processing and fishing vessels. The division also provides technical assistance to both lenders and business. The Overboard Discharge Replacement Program was authorized by the legislature to provide 100 percent loan insurance to lenders for a business' removal, rehabilitation or replacement of certain wastewater disposal systems which discharge into the marine environment.

#### Department of Human Services

Largest of all the state departments, the Department of Human Services is responsible for administering a wide-ranging system of programs in social and rehabilitation services, income maintenance, public health and medical services. The Bureau of Health's Division of Disease Control is responsible for, among other things, the prevention of illnesses which are attributable to environmental hazards. The bureau, for example conducts water quality monitoring for radionuclides near the Maine Yankee Atomic Power Plant. The Environmental Health Program within the division is responsible for assuring the environmental health problems, questions, and issues in the state are satisfactorily addressed by State Government. Such projects include the assessment of the safety for human consumption of fish and wildlife contaminated with metals or dioxin. In addition, the bureau also administers the Wastewater and Plumbing Control Program.

## Department of Agriculture, Food, and Rural Resources

Within the Department of Agriculture, the State Soil and Water Conservation Commission was established to provide for the protection, proper use, maintenance and improvement of soil, water and related natural resources of the state. The primary responsibilities of the commission are to assist Soil and Water Conservation Districts in the preparation and implementation of their locally-developed soil conservation programs through direct assistance, technical and financial assistance and coordination with other state and federal agencies. The commission is also responsible for carrying out public works projects for the prevention of soil erosion and floods and the conservation of water resources, and to conduct surveys, investigations and research. The commission consists of twelve members: Vice President for Research and Public Service of the University of Maine; the Commissioners of Marine Resources, Agriculture, Conservation, Inland Fisheries and Wildlife, and Environmental Protection, six Soil and Water Conservation District Supervisors, and six additional district supervisors from each of the specified areas of the state who are elected at an annual meeting of the district supervisors.

### *B. Regional Authorities*

There are several regional organizations which play a role in marine-related activities. The ***Gulf of Maine Council on the Marine Environment*** was created recently by the Governors and Premiers of Massachusetts, New Hampshire, Maine, New Brunswick and Nova Scotia to discuss and act upon environmental issues of common concern in the Gulf of Maine region. These issues include the protection and conservation of the ecological balance within the Gulf ecosystem, marine debris and medical waste, the relationship between land use and the marine environment, the sustainable use of resources within the Gulf and cooperative programs to better protect and conserve the Gulf's natural resources. Specifically, the Council is charged with developing a 10-year natural resources action plan and a monitoring plan for the Gulf of Maine. The Council is composed of two representatives from each of the Gulf states and provinces appointed by the respective Governors and Premiers.

There are two regional organizations relating to fisheries in which Maine participates: the ***New England Regional Fishery Management Council*** (NEFMC) and the ***Atlantic States Marine Fisheries Commission*** (ASMFC). The NEFMC was created by the federal Magnuson Fisheries Conservation and Management Act as one of eight regional councils responsible for the management of fishery resources in federal waters (i.e., waters from 3-200 miles offshore). The Commissioner of Marine Resources sits as member of the Council along with his counterparts in the New England states and federal and industry representatives. The ASMFC is an organization consisting of the marine resource agency directors from each of the Atlantic seaboard states which is responsible for coordinating interstate fisheries management.

### *C. Local Agencies*

On the front line of management of coastal and marine resources are Maine's 144 coastal municipalities. Municipalities shape the coastal land use patterns through planning and zoning; manage harbor areas, and shellfish management ordinances.

The Mandatory Shoreland Zoning Law (30-A MRSA §435) requires all municipalities to zone the land area within 250 feet of high water. While Shoreland Zoning does not zone the water, decisions made about the use of upland areas influences the use of water areas. For example, a marine only zone protects access for water dependent uses.

Use of local harbors can be guided through local harbor ordinances. Title 38 MRSA Chapter 1 provides the context for municipalities to develop ordinances that designate navigation channels, mooring and anchorage areas, and enforcement.

Municipalities also play major roles in coastal issues such as dredging of harbors, public access, promotion of local marine business, and protection of water quality.

#### *D. Federal Agencies*

While the focus of this study is state government's role in managing Maine's marine waters, it is also important to understand the role of the federal government. The following is a brief summary of the general role of relevant federal agencies.

Federal agencies with significant roles in the marine environment are: (i) the National Oceanic and Atmospheric Administration (NOAA); (ii) Minerals Management Service; (iii) U.S. Geological Survey; (iv) U.S. Fish and Wildlife Service; (v) U.S. Coast Guard; (vi) Army Corps of Engineers; (vii) Environmental Protection Agency; (viii) the Navy; and (ix) the Department of State (which is responsible for the development of all foreign-related matters and the ocean). *NOAA* is responsible for providing scientific information about the oceans and atmosphere and managing living marine resources. Some of its marine scientific-related missions include monitoring coastal water quality, fisheries stock assessment, and global climate change research. In addition, the agency has administrative and management responsibilities concerning fisheries, marine mammals, endangered marine animals, coastal zone management, marine sanctuaries, and estuarine reserves.

The U.S. Department of the Interior houses three important agencies with marine-related responsibilities. The *Minerals Management Service* (MMS) is responsible for the management of oil, gas and mineral development on the Outer Continental Shelf. MMS also provides funding for survey and research work on the continental shelf. The *U.S. Geological Survey* is responsible (in conjunction with NOAA) for mapping and research of the geology of the nation's Outer Continental Shelf. The *Fish and Wildlife Service* is responsible for the protection and management of endangered and threatened species, wildlife refuges, seabirds, certain species of marine mammals and wildlife habitat, including wetlands. The service carries out this role, in part, through research or by providing advice and recommendations to other state and federal regulatory agencies on the effects of particular projects on fish and wildlife resources.

The *U.S. Coast Guard* is responsible for the control of navigation in U.S. waters, enforcement of U.S. laws on waters subject to U.S. jurisdiction, and search and rescue of individuals in peril on U.S. waters. Some of these responsibilities include designating traffic separation schemes, inspecting commercial vessels that enter and operate in U.S. ports, regulat-

ing the disposal of waste from vessels, enforcement of U.S. Drug Policy, and establishing aids to navigation. The Coast Guard is also the Federal On Scene Coordinator responsible for spill prevention measures as well as directing the clean-up of any oil or hazardous chemical spills in the marine environment and enforcing penalties against those responsible for the spills.

The *U.S. Army Corps of Engineers* is responsible for the provision of safe and navigable waterways. The Corps is charged with the dredging of navigational channels, ports and harbors, construction of jetties, breakwaters, and other navigational safety features. The agency is also responsible for regulating private development in wetlands and navigable waters. Any project involving filling, dredging, construction, or modification of any navigable waters or wetlands requires approval from the Corps. In addition, any project involving the placement of structures in navigable waters, such as piers, wharves, marinas and other similar structures requires approval from the Corps.

The *Environmental Protection Agency* is responsible for research, monitoring, standard setting, implementation, and enforcement of the nation's pollution control laws. Major responsibilities with respect to the marine environment include the regulation of industrial and municipal discharges, ocean dumping, and aquaculture, and development of best management practices for nonpoint sources of pollution (such as agricultural and urban runoff). EPA's National Estuary Program is an important component of their marine-related responsibilities. The NEP's purpose is to identify bays and estuaries throughout the country that are suffering from or threatened by pollution and habitat degradation and to develop management strategies to restore and maintain those ecosystems. Casco Bay has been designated an estuary of national significance under the NEP and a management committee consisting of local, state, federal, and public representatives is developing a management plan for the bay.

## Summary

Figure 9 summarizes the various agencies' roles in the marine environment. As the table graphically demonstrates, numerous state and federal agencies have a role in managing the uses and values of Maine's marine environment. Any recommendations on developing a comprehensive management approach for the marine environment must inevitably consider mechanisms for improving coordination among the various agencies, including reorganization of those state agencies concerned with the marine environment. In order to develop such recommendations the following two chapters will consider the following questions: Is state government, as currently structured, able to deal adequately with the numerous management problems that are occurring? Is the state government structure causing inefficiencies in the administration of the numerous laws and mandates which affect the marine environment? Are there other alternative forms of government structure that could better manage the existing and future uses off Maine's coast?



State and Federal Agencies and the Marine Environment

	DEP	DMR	SPO	MGS	BPL	DOT	IF&W	DECD	MRB	NOAA	EPA	COE	USCG	F&WS	MMS
marine resource regulation		x*								x*					
marine wildlife & habitat protection	x	x					x			x	x			x	
research/monitoring	x	x	x	x			x		x	x	x	x		x	x
marine transportation safety/planning	x					x						x	x		
recreation/public access			x				x	x					x		
pollution control	x*	x									x*		x*		
aquaculture	x	x*	x				x			x	x	x	x	x	
submerged lands	x*	x		x	x*		x	x		x		x*			
enforcement	x	x					x			x	x	x	x		
coastal planning			x	x				x							
policy development/planning	x	x	x		x	x	x	x		x	x	x	x	x	x
dredging and dredge spoil disposal	x*	x	x	x	x	x	x	x		x	x*	x*		x	
OCS development			x							x	x	x	x	x	x*

KEY: DEP - Department of Environmental Protection  
DMR - Department of Marine Resources  
SPO - State Planning Office  
MGS - Maine Geological Survey  
RPL - Bureau of Public Lands  
DOT - Department of Transportation  
IF&W - Department of Inland Fisheries and Wildlife  
DECD - Department of Economic and Community Development  
MRB - Marine Research Board

NOAA - National Oceanic and Atmospheric Administration  
EPA - U.S. Environmental Protection Agency  
COE - U.S. Army Corps of Engineers  
USCG - U.S. Coast Guard  
F&WS - U.S. Fish and Wildlife Service  
MMS - Minerals Management Service

\* - lead agency

Figure 11



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#### ***IV. ISSUES, PROBLEMS, AND OPPORTUNITIES***

Maine has entered an era of varied and intensive use of its marine waters and added potential for conflict over those uses. Management by crisis and on a case-by-case basis is no longer acceptable. While significant strides have been taken at the local, state, and federal levels to improve management of the marine environment, more is needed. Drawing from the previous two sections, this section attempts to discern the major crosscutting issues that are affecting management of Maine's coastal waters.

The major findings are:

##### ***A. Little Coordination Among the Numerous Marine Policies and Programs that Exist at the Local, State and Federal Levels***

While numerous state and federal laws and policies apply to specific uses of the marine environment, no comprehensive policy describes the state's overall goals and objectives in the marine environment. That is, policies address specific uses of the coastal waters such as fishing, oil transportation, and waste disposal independently of one another -- despite the reality that each of these uses can and does affect the other. Clearly, these individual policies are necessary. They should be established, however, within a broader context to ensure they are coordinated. The individual policies do not add up to a unified state agenda for the marine environment.

Similarly, no consistent process exists for establishing priorities among the many disparate policies affecting the coastal waters of the state. For example, what uses or values, if any, should have priority over other uses? What priorities should be set for funding purposes? To some extent the Legislature has established priorities on the shoreline by requiring state agencies to give preference to water-dependent uses over other uses.<sup>92</sup> In addition, local governments are encouraged to give preference to water dependent uses.<sup>93</sup> The Public Trust Doctrine provides some limited guidance in that public trust uses cannot be foreclosed unless a public purpose is served by doing so. However, the doctrine does not assign priorities among the various public trust uses.

The absence of a comprehensive policy leads to inefficiencies in government, misallocation of financial resources, and can allow conflicts in the coastal waters to go unresolved or resolved only after lengthy delays. Two examples will help highlight the ramifications of the lack of a comprehensive state marine policy. Currently no mechanisms exist for determining which harbors should have priority for dredging, which should not be dredged, and where to dispose of the dredge spoils. The state can only react to dredging and disposal

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<sup>92</sup> 38 MRSA, 1801-1803. Policy 3, Shoreline Management, of the Coastal Management Policies Act, directs state agencies to "support shoreline management that gives preference to water-dependent uses over other uses."

<sup>93</sup> 38 MRSA, sec. 447, Mandatory Shoreland Zoning Act, "Municipalities are encouraged to give preference, when appropriate, to functionally water-dependent uses and may extend zoning controls to accomplish this."

proposals. Furthermore, there is no clear articulation on what the state's role should be with respect to dredging. For example, should the state be actively promoting dredging in particular harbors and actively discouraging dredging in other harbors? Moreover, there is no one agency that represents the state before the federal government on this critical issue.

Another example concerns the dual state policies of protecting wildlife (e.g. seabirds and marine mammals) and promoting the state's commercial fishing industry, with the Departments of Inland Fisheries and Wildlife and Marine Resources responsible for implementation of these policies respectively. In certain cases these policies can and do clash. For example, marine mammals, marine birds, and commercial fish species all share the same ecosystem for food and habitat. However, each is managed separately and there is no overall guidance as to how to reconcile the differences between the important goals of each of these policies.

Perhaps the closest expression of a "comprehensive policy" for the marine environment is contained in the state's oil pollution control law which states, in part, that:<sup>94</sup>

The Legislature finds and declares that the highest and best uses of the seacoast of the State are as a source of public and private recreation and solace from the pressures of an industrialized society, and as a source of public use and private commerce in fishing, lobstering and gathering other marine life used and useful in food production and other commercial activities.

The Legislature further finds and declares that the preservation of these uses is a matter of the highest urgency and priority and that such uses can only be served effectively by maintaining the coastal waters, estuaries, tidal flats, beaches and public lands adjoining the seacoast in as close to a pristine condition as possible, taking into account multiple use accommodations necessary to provide the broadest possible promotion of public and private interests with the least possible conflicts in such diverse uses.

One could conclude that it is the state's policy that: (1) the highest and best use of the seacoast<sup>95</sup> is for recreation and fishing; (2) preservation of these uses is a matter of highest urgency and priority; (3) the most effective way to preserve these uses is by maintaining the state's coastal waters in as close to a pristine condition as possible; and (4) multiple uses should be promoted. However, this statement of policy has no operational mechanisms by which it can be implemented. In addition, the policy statement is buried in a statute dealing with oil pollution control and is therefore not seen in the broader context. Furthermore, it provides no criteria for resolving conflicts.

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<sup>94</sup> 38 MRSA sec. 541

<sup>95</sup> It is not clear what the geographic scope of the term "seacoast" is, however, one can infer that it means both the coastal land and coastal waters of the state.

Another effort by the legislature to enact policy relevant to the coast and adjacent coastal waters resulted in adoption of nine coastal management policies.<sup>96</sup> The law states that:

The Legislature finds that the Maine coast is an asset of immeasurable value to the people of the State and the nation, and there is a state interest in the conservation, beneficial use and effective management of the coast's resources; that development of the coastal area is increasing rapidly and that this development poses a significant threat to the resources of the coast and to the traditional livelihoods of its residents; that the United States Congress has recognized the importance of coastal resources through the passage of the United States Coastal Zone Management Act of 1972 and that in 1978 Maine initiated a coastal management program in accordance with this Act which continues to be of high priority; and that there are special needs in the conservation and development of the State's coastal resources that require a statement of legislative policy and intent with respect to state and local actions affecting the Maine coast.

The Legislature declares that the well-being of the citizens of this State depends on striking a carefully considered and well reasoned balance among the competing uses of the State's coastal area. The Legislature directs that state and local agencies and federal agencies as required by the United States Coastal Zone Management Act of 1972, PL 92-583, with responsibility for regulating, planning, developing or managing coastal resources, shall conduct their activities affecting the coastal area consistent with the following policies to:

- 1. Port and harbor development.** Promote the maintenance, development and revitalization of the State's ports and harbors for fishing, transportation and recreation;
- 2. Marine resource management.** Manage the marine environment and its related resources to preserve and improve the ecological integrity and diversity of marine communities and habitats, to expand our understanding of the productivity of the Gulf of Maine and coastal waters and to enhance the economic value of the State's renewable marine resources;
- 3. Shoreline management and access.** Support shoreline management that gives preference to water-dependent uses over other uses, that promotes public access to the shoreline and that considers the cumulative effects of development on coastal resources;
- 4. Hazard area development.** Discourage growth and new development in coastal areas where, because of coastal storms, flooding, landslides or sea-level rise, it is hazardous to human health and safety;

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<sup>96</sup> 38 MRSA, 1801-1803

5. **State and local cooperative management.** Encourage and support cooperative state and municipal management of coastal resources;
6. **Scenic and natural areas protection.** Protect and manage critical habitat and natural areas of state and national significance and maintain the scenic beauty and character of the coast even in areas where development occurs;
7. **Recreation and tourism.** Expand the opportunities for outdoor recreation and encourage appropriate coastal tourist activities and development;
8. **Water quality.** Restore and maintain the quality of our fresh, marine and estuarine waters to allow for the broadest possible diversity of public and private uses; and
9. **Air quality.** Restore and maintain coastal air quality to protect the health of citizens and visitors and to protect enjoyment of the natural beauty and maritime characteristics of the Maine coast.

The preamble to the legislation states that the "well-being of the citizens of this State depends on *striking a carefully considered and well-reasoned balance among the competing uses* of the State's coastal area" (emphasis added).<sup>97</sup> This law, however, does not provide any further guidance to state or local agencies on its implementation. Without further guidance by either the legislature or the executive branch, there is little substance on which to base policy and management decisions since a number of these policies conflict with one another.

While it may not be possible to devise a policy that would prevent all conflicts and ensure coordination among all government agencies at all times, there is a clear need to develop a policy to guide planning, research and funding decisions that affect the marine environment. A comprehensive policy for the state's marine waters would enable the state to set priorities and establish a course of action for conservation and development.

#### *B. No Comprehensive Planning for the Use of Maine's Coastal Waters*

Maine, like most coastal states, lacks a tradition of comprehensive planning for the use of the state's coastal waters. Indeed, only recently has comprehensive land-use planning been introduced in Maine and other states. The new land-use planning requirements, however, stop at the water's edge, and the coastal waters are generally free for all to use.<sup>98</sup> With the advent of new and intensifying uses the current *de facto* policy of relatively open access to the state's

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<sup>97</sup> While not defined in the statute, it is assumed that the term "coastal area" refers to the state's coastal zone which has an inland boundary coincident with each of the state's coastal communities and a seaward boundary of three miles from shore.

<sup>98</sup> It should be noted, however, that coastal communities have the authority to regulate harbor use and develop harbor management plans. See, Todd R. Burrowes, Harbor Management: A Legal Guide for Harbor Masters and Coastal Officials, (Orono, ME: University of Maine Cooperative Extension Service, 1989).

marine resources may not be sufficient to protect those resources for sustainable use. Problems resulting from oil spills, pollution, habitat destruction, use conflicts and others that have plagued coastal waters of other states demonstrate that it is much more difficult and expensive to restore the environment and resolve conflicts after the fact, than it is to plan for the orderly development of the environment in a sustainable manner.

Where *policies* exist for specific uses of the marine environment, in certain cases, *plans* do not exist for specific uses of the marine environment. For example, there are fisheries management plans and vessel traffic routes to the major ports of the state. However, these and other types of plans are developed in isolation and usually on an *ad hoc* basis. There is no comprehensive pro-active planning to ensure that the public's interests in the marine environment are being fully protected.

*Ad hoc* planning does not incorporate the distinctive characteristics of the ocean environment and of the interacting human activities associated with it. Currents flow, fish migrate, and pollutants disperse. *Ad hoc* plans for wildlife protection, marine fisheries management and pollution control developed in isolation fail to consider linkages in the marine ecosystem, or linkages between economic, social, and environmental factors.

Similarly, numerous criteria and performance standards must be met prior to approval of development projects. Regulatory agencies typically assess the potential effects of a project within a narrowly prescribed range and require necessary modifications before granting approval. This type of case-by-case decision making does not, and cannot assess larger issues such as: How does the state want the marine environment to be used in the broadest sense? Which uses should have priority over others? And what is the optimum use of a given region of the marine environment from economic, social and environmental perspectives? Further, project-specific impact assessment cannot assess the "cumulative effects" of any one proposal.

Comprehensive planning in the marine environment can serve to: (a) minimize conflicts; (b) assess the cumulative effects of expanding ocean use; (c) direct research activities towards priority needs; (d) apportion resources and space to a variety of users; and (e) ensure the sustainability of the marine ecosystem.

### *C. Inadequate Coordination Among Government Agencies*

Twenty-eight different state agencies and six different federal agencies have some decision-making or planning responsibility in the marine environment. While the number of agencies is not, in and of itself, a problem, the lack of coordination between and among the agencies is. Each of these agencies has its own mandates, goals, policies and procedures, which often conflict with one another. Separate agencies manage fisheries, marine birds, marine mammals, vessel traffic, and dredging and dredge spoil disposal. Inadequate coordination confuses the public, the regulated community, and the federal government as to which agency is responsible for policy and management decisions. Decisions regarding the use and protection of the marine environment demand, by their very nature, *consistent* interagency coordination. Few marine policy or management decisions affect only one use or value in the marine environment.

The 144 coastal municipalities also have decision-making responsibility for the marine environment. In some cases, state and federal policies do not reflect the concerns of municipalities. Coordination among towns that share marine resources is often weak. The Casco Bay Estuary Program is an example of a program aimed at improving coordination among towns, state and federal agencies.

As discussed in Chapter III the Land and Water Resources Council recently established the Marine Policy Standing Committee to remedy the problems noted above. The committee meets to exchange information, coordinate projects and programs, and develop policy as needed. While not empowered by legislative or executive order, the committee has been successful in bringing the various agencies to the table for discussion on issues of common concern.

The recently established Marine Research Board will go a long way towards improving coordination among not only state agencies, but also private institutions in the area of marine research. This body is charged with developing a biennial statement of research priorities for the state of Maine and coordinating research among all marine research institutions in the state. As noted, however, its mandate is limited to marine research and does not directly concern itself with policy or management.

#### *D. Lack of Adequate Criteria for Resolving Conflicts Among Competing Uses*

While conflicts in Maine's coastal waters have not been catalogued, a few examples will highlight the types of conflicts common in our coastal waters:

- one-third of Maine's shellfish beds are closed due to sewage pollution and nonpoint source pollution;
- increasing use of marine waters can threaten the integrity of special marine areas, i.e., shellfish areas, spawning areas, etc.;
- transportation and disposal of dredge spoils in heavily used lobstering areas off the southern Maine coast;
- hazards to navigation in certain areas created by too many lobster traps;
- placement of salmon pens and other aquaculture equipment in coastal waters affecting the "rights" of riparian owners to a "pristine view" of the ocean and the "rights" of commercial fishermen to continue to use traditional fishing grounds;
- fishing in certain areas off the Maine coast at times conflicts with the preservation of marine mammals and vice versa;
- dredging of ports and harbors vs. protection of marine habitat;



- harvesting of some types of marine fisheries may conflict with the need to protect seabirds in the Gulf of Maine; and
- commercial vs. recreational use of coastal waters.

Conflicts such as these generally occur because of: (i) the need or desire to use the same space for two or more different and incompatible purposes; or (ii) real or perceived environmental threats caused by one use affecting the environment's ability to sustain other uses. Despite the oceans' vast size, in fact, only limited areas are desirable for lobster fishing, placing salmon pens for aquaculture, clam harvesting, anchoring boats, placing marinas and other uses. It should be emphasized that the perception that a conflict exists is as important as the fact that a conflict exists. Increased communication between the various interests should help to resolve real and perceived conflicts.

When conflicts arise between uses of the marine environment there is very little guidance in either policy or law to assist in resolving those conflicts. For example, if a pending aquaculture lease conflicts or could conflict with a pending submerged land lease, the state's Aquaculture Lease law requires the Commissioner of Marine Resources and the Commissioner of Conservation to determine which project is "in the best interest of the State."<sup>99</sup> The legislature has provided limited guidance to resolve conflicts between users of different types of fishing gear. The Commissioner of Marine Resources has the authority to develop regulations to prevent conflicts among harvesters of marine resources. In developing such regulations the commissioner must consider (i) traditional uses of marine organisms; (ii) total economic benefits to the area in which the organisms are harvested; and (iii) optimum economic and biological management of marine resources.<sup>100</sup> The law also requires the commissioner to "accommodate the needs of all interested parties to the maximum extent possible, through provisions of joint use, alternate use or other methods." While this law applies only to resolving conflicts between harvesters of marine resources, such considerations could be adapted for guiding the resolution of other conflicts within the marine environment.

To a limited degree, some of these conflicts are resolved by separating different marine uses. In Bar Harbor, lobster gear and other fishing gear can not be placed in shipping lanes. Harbor management plans divide harbors into different uses areas. Unlike land, marine waters are not private property but a public resource for which the state government is the trustee. As use of Maine's marine waters increase options such as identifying use areas and sensitive areas may help limit use conflicts.

#### *E. Lack of Adequate Information for Decision Making*

Planning and policy development at any level of government can be only as good as the quantity and quality of information accessible to decision-makers. Indeed, it is imperative that

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<sup>99</sup> 12 MRSA, section 6072, para. 14.

<sup>100</sup> 12 MRSA 6171-A

we have a sound understanding of the marine ecosystem and the dynamics of human use of that ecosystem. A report by the recently established Maine Marine Research Board, however, makes it clear that adequate information in Maine is not available. The reader is referred to that report for a more detailed discussion of this issue.<sup>101</sup> Nevertheless, decisions must go forward based on the best available information. Without better information regulatory and management decisions and other decisions necessary for the development of a comprehensive marine policy and plan may result in unexpected negative effects.

Several recent efforts are adding to our information base: (i) the Casco Bay Estuary Program is in the process of mapping resources and uses in the Casco Bay region using a geographical information system (GIS) which will serve as a useful model for other estuaries; (ii) the Maine Geological Survey is engaged in a multi-year project to survey and map the geology and topography of the seafloor out to the 100-meter isobath which will be archived on the state GIS; (iii) the Commission to Study Maine's Oil Spill Cleanup Preparedness has funded a project, being carried out by the Department of Environmental Protection, to map sensitive areas along the coast; and (iv) the Bureau of Public Lands is inventorying and registering all existing structures located on the coast.<sup>102</sup>

Despite these efforts, basic information and better methods for exchanging that information is needed for such items as:

- the function of marine ecosystems and the relationship between human activities and environmental impacts;
- the location of ecologically important marine habitats;
- carrying capacity or tolerance levels of bays and other semi-enclosed marine water bodies;
- the natural variability of the marine environment;
- physical oceanographic characteristics of Maine's coastal waters;
- socio-economic trends in marine industries;
- regional needs for various types of marine infrastructure;
- relative value of the uses of the marine environment; and
- the true cost of using the marine environment for waste disposal.

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<sup>101</sup> Marine Research Board, Marine Research Priority and Action Plan, Biennial Report, FY 1992-1993, April, 1991.

<sup>102</sup> Report of the Commission to Study Maine's Oil Spill Cleanup Preparedness, November 1990, Office of Policy and Legal Analysis, State of Maine Legislature, Augusta, ME.

#### *F. Public Awareness and Understanding of Marine Environment*

Educating people about the marine environment is a special challenge because the ocean's timeless blue surface does not appear to harbor toxic contaminants, disrupted habitats, or to be the site of conflicts between users. Unlike land resources where the scars on its surface are plainly visible, disruptions in the marine environment may not be readily apparent or understood. The effectiveness of any marine policy efforts depends on increased awareness and understanding of the marine environment.

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## ***V. OPTIONS FOR COMPREHENSIVE MANAGEMENT OF MAINE'S MARINE WATERS***

In this chapter several options are outlined which would lay the groundwork for a comprehensive marine policy and an integrated marine management program. Specifically, this section discusses (i) considerations for developing a comprehensive policy for the state; (ii) various institutional arrangements to guide the implementation of policy and planning; and (iii) management tools available to implement a comprehensive policy.

### ***A. Considerations for a Comprehensive Policy***

A clearly articulated comprehensive policy for the state's marine waters should be developed by state government with substantial input by environmental and economic interests and the general public. The purpose of a comprehensive policy would be to establish goals, objectives, and priorities to guide marine research, resource management, and environmental regulation in the marine environment. Such a policy should be based on clearly defined criteria. These criteria could include:

- promotion of the sustainable use of the marine environment;
- equitable distribution among the people of the state of the socio-economic benefits derived from the marine environment;
- accommodation of multiple uses while minimizing conflicts among competing users;
- granting priority to the management and protection of living resources over non-living, non-renewable resources;
- protection of the ecological integrity of state's marine waters for use by future generations;
- establishment of a process for resolution of conflict between existing policy mandates;
- promotion of research in the Gulf of Maine through Maine's Marine Research Board and other research organizations; and
- preservation of Maine's maritime heritage.

The concept of a multiple-use policy has been applied on both federal and state public lands. A multiple-use policy does not mean allowing all uses everywhere, rather it is intended to accommodate several uses in a given region. While this may be the de facto policy in the marine environment, as pointed out earlier, there is no articulation of which uses are a priority or how conflicts between uses are to be resolved. In an environment of expanding use, the status quo is no longer sufficient. New or expanding uses will result in conflicts which may damage the marine environment and cause the loss of social and economic benefits to the different users of the state's marine waters and to the people of the state.

A multiple-use policy has already been articulated for public reserved lands in Maine. The Legislature requires the Bureau of Public Lands to manage the public reserved lands:

under the principles of multiple use to produce a sustained yield of products and services and that this management should be effected by the use of both prudent business practices and the principles of sound planning...

The term "multiple use" is defined in statute as:<sup>103</sup>

- (1) The management of all the various renewable surface resources of the public reserved lots, including outdoor recreation, timber, watershed, fish, and wildlife and other public purposes;
- (2) Making the most judicious use of the land for some or all of these resources over areas large and diverse enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions;
- (3) That some land will be used for less than all of the resources; and
- (4) Harmonious and coordinated management of the various resources, each with the other, without impairing the productivity of the land, with consideration being given to the relative values of the various resources and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

An adaptation of this policy which incorporates the unique conditions of the marine environment and the human activities associated with it should be developed for the state's marine waters. The state's nine coastal management policies should serve as the point of departure for the development of a comprehensive multiple-use policy. While somewhat vague and conflicting, as suggested in the previous section, the policies do provide a framework within which to work. Additionally, the policies have the added benefit of addressing both marine and coastal issues. Policies affecting the landward portion of the coastal zone must be integrated with policies affecting the seaward portion.

In addition, a State comprehensive marine policy must involve the interests of local communities. Shellfish and harbor management ordinances and comprehensive plans indicate local preferences for use and protection of coastal and marine resources.

### *B. Institutional Arrangements*

In Maine, 144 coastal communities, 17 state agencies and six federal agencies are engaged have jurisdiction in the marine environment. As noted previously, no single governmental entity establishes standards or policies for all activities in the marine environment. The past, *ad hoc* development of marine policies and management practices has resulted in several

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<sup>103</sup> 12 MRSA sec. 585, subsection 2, para. A

unrelated entities having overlapping responsibility in the marine environment. Integration of the functions performed by these entities will result in more efficient and effective management of Maine's marine environment.

An important step towards integration of marine functions has already been taken with the creation of the Marine Policy Committee of the Land and Water Resources Council. The committee serves as a forum for information exchange among the relevant state agencies, identifies issues of concern, and develops policy as necessary. The committee is chaired by the Commissioner of Marine Resources and staffed by a marine policy coordinator in the State Planning Office. Regardless of potential changes in institutions, the implementation of a comprehensive marine policy by this committee will be the most effective tool for improving marine management.

Options for implementation of a comprehensive approach to marine management include (1) broadening and strengthening the existing Department of Marine Resources; and (2) establishment of a broadly represented advisory council.

### Consolidation of Marine Programs

As discussed earlier, numerous agencies within state government have responsibility in the marine environment. One approach to improving interagency coordination and comprehensive planning would be to consolidate the state's marine/coastal management functions into one department. This would have the obvious advantage of combining all the marine-related regulatory, research and resource management functions of state government under one roof. An "oceans department" would allow for comprehensive planning and management since all marine programs could be working toward the same goals and objectives under the administrative leadership of one department. A new department would eliminate the problem of numerous agencies pursuing related and potentially conflicting mandates and programs.

Maine is unique among coastal states in that it already has a cabinet-level department whose sole mission is the marine environment. However, most of the Department of Marine Resources' (DMR) efforts have been focused on marine fisheries. Given DMR's expertise in the marine environment, it would appear that a restructured DMR would be the logical department into which marine functions should be integrated.

The drawbacks to creating a marine "super" agency are that programs that currently function efficiently within their home agencies, such as submerged lands, would have to be split between their marine and non-marine components. Consolidation of marine programs will require thoughtful consideration in order to accurately assess the advantages and disadvantages of realigning the marine-related functions of State government. In addition, consideration must be given to impacts on interactions with federal and local governments.



## Marine and Coastal Resources Council

An additional approach to the one suggested above would be to establish an advisory council which would include state agencies, interest group representatives, the research/academic community, and the public. This approach has the advantage of bringing the perspective of non-governmental interests directly into the process. The establishment of a public advisory committee would ensure the participation of the public, interest groups, and the research community in DMR's activities. If DMR is expanded to incorporate many of the State's responsibilities with regard to the marine environment then this advisory committee would serve a function similar to the DMR's existing Advisory Council. If the State's marine management programs remain divided among several agencies this council could serve the role of providing broad based input to the overall coordination of the State's marine programs.

Hawaii, North Carolina, and Oregon have appointed councils to assist in the management of ocean resources. Hawaii has established an Ocean and Marine Resources Council. The Council consists of agency representatives and members appointed by the Governor representing industry, recreational and environmental interests, and the research community. The Council is responsible for advising and assisting the governor and legislature on matters pertaining to the use, development, and management of Hawaii's ocean resources by: (1) serving as a forum for comprehensive ocean policy formulation, public and private sector coordination and information dissemination; and (2) planning, coordinating, and facilitating development and implementation of the Hawaii Ocean Resources Management Plan.<sup>104</sup>

North Carolina created a Marine Science Council in 1975 to: (1) encourage the use and study of the ocean and coastal waters of the State of North Carolina by citizens and industries of the State; (2) coordinate efforts toward full development of the State's marine resources with proper attention being given to the need for conservation; (3) coordinate plans for, and work with relevant government agencies in, the implementation of all federal, State and local legislation relating to coastal and marine resources; and (4) review all research, education, and management programs relating to coastal and marine resources. The Council comprises relevant state agency representatives and 21 members appointed by the Governor.<sup>105</sup>

The Oregon legislature is currently considering a proposal to establish a permanent Ocean Policy Advisory Council. The council would consist of relevant state agencies, a county commissioner, environmental and user group representatives, and three members of the public. The council will be charged with: (1) coordinating the preparation of a management plan for the state's territorial waters; (2) providing a forum for discussing ocean resource policy, planning and management issues and when necessary mediating disagreements; (3) offering advice to the Governor and state agencies on specific ocean resource management issues; (4) coordinating interagency and intergovernmental review of specific ocean resource projects or actions; and (5)

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<sup>104</sup> Hawaii Ocean and Marine Resources Council, Hawaii Ocean Resources Management Plan, Honolulu, HI, January, 1991

<sup>105</sup> North Carolina Marine Science Council, Ocean Policy Committee, North Carolina and the Sea: An Ocean Policy Analysis, Raleigh, NC, 1984.

encouraging participation of federal agencies in discussion and resolution of ocean resources planning and management issues affecting the state.<sup>106</sup>

### *C. New Marine Management Tools*

#### Ecosystem Management

While the focus of this study has been on the state's marine waters, management should focus on the ecosystem as a management unit. Maine's marine waters are part of a larger ecosystem is the entire Gulf of Maine. Pollutants, fish, marine mammals, and currents do not stay confined neatly within state boundaries, they move throughout the region and beyond. The effects of activities in one area of the Gulf within another state's or province's jurisdiction may be felt within Maine's coastal waters, and, conversely, activities conducted within Maine's coastal waters may cause problems within another's jurisdiction. Ecosystem management in the marine environment is complicated by the numerous state and federal agencies involved in managing different parts of that ecosystem. It is further complicated by the jurisdictional division between the state and federal government three miles offshore, which is an arbitrary line from the ecosystem's perspective. Moreover, the international boundary with Canada causes additional constraints on ecosystem management. However, we must begin to move in the direction of ecosystem management if we are to sustain the Gulf of Maine, including Maine's coastal waters.

Three recent developments bode well for ecosystem management in the Gulf. The first is the establishment of the Gulf of Maine Council on the Marine Environment, a joint state-provincial body whose charge is to promote the protection and conservation of the Gulf of Maine ecosystem. This effort has been successful in bringing together federal, state, and provincial officials involved in the regulation, planning and management of marine and coastal resources in the Gulf region on both sides of the international boundary. The second development is the recently enacted federal Marine Research Act which authorizes the establishment of regional marine research programs for each of nine marine regions of the U.S., including the Gulf of Maine. The regional research board for the Gulf area has developed a marine research plan for the Gulf and has established a grants program to carry out the priorities in the plan. While not specifically including the Canadian side of the Gulf, it is hoped that, through the Gulf Council, Canadian research efforts will be coordinated with those of the United States.

#### *a. Inventorying Marine Resources and Habitats*

Mapping and resource/habitat inventory efforts in Maine's marine environment to date have been limited largely to intertidal areas or have focused on specific species such as certain marine birds and seals and not on ecosystem parameters. A comprehensive effort focused on the uses and habitats of all the state's coastal waters is necessary to inform planning and management decisionmaking.

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<sup>106</sup> The Oregon Ocean Resources Management Task Force, The Oregon Ocean Plan. Portland, OR, January, 1, 1991.

In this context, sensitive areas are those areas of the marine and coastal environment that serve as habitat for commercially or ecologically important species of wildlife that may be susceptible to an oil spill. Such areas would include, for example, seabird and shorebird nesting areas, seal haul outs, clam flats, wetlands and other areas. Obviously the information developed under this program will be important not only for oil spill contingency planning but also generally for coastal and marine management. As such, it is important that the information generated and the data base developed are made useful for multiple purposes. This effort will most likely focus on nearshore and intertidal environments, but will likely also provide an excellent first step for a broader mapping and inventory program for all the state's coastal waters. One important aspect of this proposed program is that the data will be entered into the state GIS. This will allow the data to be updated easily and will allow spatial manipulations of the data.

Use of computerized mapping, such as is provided by GIS, contributes two advantages to marine planning and management. First, computerized maps are more consistent and can more easily be kept up-to-date than hand drawn maps. Secondly, systems such as GIS allow for modelling of the criteria and impacts of different management techniques. For example, if it is desired to restrict dredging of soft bottom sediments in waters less than 20 ft in depth, the nature and extent of such restrictions can be modelled using GIS, assuming the necessary data have been acquired.

The expansion of the Oil Spill Commission's sensitive area mapping to include the attributes under study by MGS and the Casco Bay Estuary Program would provide an important tool for comprehensive marine planning.

An important aspect of inventory work will be to identify the benefits provided by the State's public marine resources and assess the effect of use conflicts on these benefits.

#### b. Capability/Suitability Analysis

Capability/suitability analysis is a type of strategic planning that can be used to determine appropriate uses of certain areas within ecosystems.<sup>107</sup> Simply put, these analyses are planning studies to determine the suitability of a given region for a particular activity or activities, taking into consideration the physical, ecological and cultural constraints of that region. British Columbia and Norway have used this approach for the designation of areas most suitable for net-pen aquaculture.

The province of British Columbia identified several areas of its coastal waters to study because of their potential for conflict between aquaculture and other uses.<sup>108</sup> The studies, known as the Coastal Resources Information Studies, identified coastal waters which were valued by a

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<sup>107</sup> David Kelly, et. al, "Developing a Strategic Assessment and Planning Framework for the Marine Environment," 25 Journal of Environmental Management, 219-230, 1987.

<sup>108</sup> Parametrix, Inc. State of Maine Aquaculture Monitoring Program, prepared for the Department of Marine Resources, 1990.

number of different resource users. The coastal waters were then divided into three categories based on the potential for conflict: (i) conditional opportunity areas; (ii) limited opportunity areas; and (iii) no opportunity areas. Aquaculture pens are allowed in both conditional and limited opportunity zones with more restrictions placed on those pens within limited opportunity zones. Aquaculture is prohibited in no opportunity zones. It appears that this approach was based solely on existing and potential uses and the potential for conflict between the uses and did not consider the environment's capacity for supporting net-pen aquaculture.

Norway developed a system known as LENKA which provides the information base on aquatic capacity to aid in making wise and rational choices among the many possible uses of the marine environment.<sup>109</sup> This approach is more comprehensive than British Columbia's CRIS in that it also considers the marine environment's capacity for supporting aquaculture in addition to other existing and potential uses. The literal translation for the acronym LENKA is -- "nationwide analysis of the suitability of the Norwegian coastal zone and watercourses for aquaculture." LENKA is a multi-year investigation which is proceeding in three phases: (i) partitioning of the Norwegian coastal zone into 320 zones based on topography, hydrography, oceanography, salinity, icing and other factors; (ii) characterization of the zones - data was sorted in four separate groups: environment, use, infrastructure and special areas; and (iii) assessment of the capacity of the zones -- both an assessment of the maximum permissible organic loading of the zone and an assessment of the space available for aquaculture. Combining the information from the characterization and the capacity assessments will lead to designation within each zone of those areas most suitable for net-pen aquaculture.

While the Norwegian and British Columbian approaches have focused on aquaculture, this method could be easily adapted to consider all marine uses. Maine could conduct similar analyses for its coastal waters. The purpose of the analyses would be to assess existing activities, existing resources and habitats, physical and biological oceanographic conditions, the potential for new activities and supporting infrastructure and to develop a management plan based on the assessments. The studies could proceed in two phases: (i) selection of areas that are under greatest pressure from increased activity; and (ii) selection of areas where the potential for increased activity seems likely.

### c. Research and Education

Continued research regarding the impacts of human activities on the marine environment is critical to improving the management of this ecosystem. Enhanced information regarding the natural variability of the marine environment and the range of its responses to various impacts will inform marine management at all levels of government. The competitive grants program established by the Marine Research Board now receives only limited funds from the Maine Environmental Trust Fund. Although current budget constraints lessen the likelihood of a legislative appropriation in the short term, federal funding options should be explored.

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<sup>109</sup> The following description is taken from James E. Stewart, Stephen Thorton, and Edmund C. Penning-Rowell, The LENKA Project in Relation to Coastal Zone Management in Norway: A Case Study. Prepared for The Group on Natural Resources Management, Organization for Economic Cooperation and Development, 1990.

Effective protection of Maine's marine environment will ultimately depend on our ability to educate people about issues concerning both nearshore waters and their watersheds. Existing efforts, such as the Maine Coastal Program's work to promote Coast Week, DMR's outreach to public schools and the work of various river and Bay associations should be supported and expanded.

### Conflict Resolution

Conflict resolution involves restricting uses with regard to the area or time of operation or with regard to types of equipment used. Compromise among conflicting groups does not always result in a loss of benefits for one of the affected parties. In many cases, the resulting arrangement provides the same or greater benefits. Permitting and leasing, negotiated settlements, zoning and special management areas are four techniques used to resolve conflict among users of public trusts resources.

#### a. Permitting and Leasing

Maine's Natural Resource Protection Act (NRPA) requires permits for dredging, filling, construction, repair or alteration in coastal wetlands, which are defined broadly to include all intertidal and submerged lands. The Army Corps of Engineers requires permits for construction of permanent structures (including floating net pens). These programs are focussed on protecting habitat from the cumulative impact of coastal development.

Leasing is a means by which the State can reduce conflict among users by granting private use of public trust resources in limited areas. Such uses must contribute to greater public good; aquaculture, for example, provides jobs for declining coastal economies.

#### b. Site Specific Negotiated Settlements

Not all use conflicts require statewide solutions. In many cases, problems can be resolved with a negotiated agreement among the parties. Conflicts amenable to this type of solution include those between lobstermen and large vessel traffic in congested harbors.

#### c. Marine Zoning

A comprehensive approach to use management involves marine zoning which can be used to address cultural and economic issues as well as environmental suitability. While zoning is a well-accepted tool to manage land use it is rarely used in a comprehensive manner in the marine environment. Nevertheless, numerous state, provincial and national governments use some form of zoning in the marine environment. In fact, there already are forms of zoning in Maine's coastal waters. For example, the Department of Marine Resources establishes closed areas and conservation areas for shellfishing; the Department of Environmental Protection established vessel anchorages in the state's coastal waters for the purpose of vessel to vessel transfer of



oil;<sup>110</sup> the Department of Inland Fisheries and Wildlife is charged with designating significant wildlife habitat that will be used in permitting decisions; the U.S. Coast Guard has established a voluntary traffic separation scheme to guide commercial vessel traffic in and out of Portland harbor; and the State Legislature has classified all of the state's marine/estuarine waters into three broad categories. The Department of Environmental Protection administers the classification program by placing various levels of restrictions on discharges of pollutants according to the impact of the discharge on water quality parameters, indigenous flora and fauna, fishing, swimming and other uses. The three categories are:

Class SA, is to be applied to waters which are outstanding natural resources and which should be preserved because of their ecological, social, scenic, economic or recreational importance. Direct discharge of pollutants to Class SA waters is prohibited;

Class SB, are marine waters that are suitable for the designated uses of recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation and navigation and as habitat for fish and other estuarine and marine life. The habitat shall be characterized as unimpaired. Discharges are allowed but must not cause adverse impacts to estuarine and marine life. New discharges to Class SB waters which would cause closure of shellfish areas by the Department of Marine Resources are not permitted. The vast majority of Maine's coastal waters are designated SB;

Class SC are waters that are suitable for recreation in and on the water, fishing, aquaculture, propagation and restricted harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation and navigation and as a habitat for fish and other estuarine and marine life. Discharges to Class SC waters may cause some changes to estuarine and marine life provided that the receiving waters are of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community.

Each of these examples, however, respond to particular threats and uses and are not coordinated with each other. More systematic efforts are in place in other jurisdictions. For example, the Rhode Island Coastal Resources Management Program has developed a zoning scheme for the state's marine waters.<sup>111</sup> The state has divided its waters into six categories: conservation areas; low-intensity use; high-intensity boating; multipurpose waters; commercial and recreational harbors; industrial waterfronts; and commercial navigation channels. Different restrictions apply to each of the six categories. The Coastal Resources Management Council, a legislatively created body appointed by the Governor, regulates development in the state's coastal waters according to these different zones.

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<sup>110</sup> Code of Maine Rules chapter 600 para. 17 and 18.

<sup>111</sup> Rhode Island Coastal Resources Management Council, *The State of Rhode Island Coastal Resources Management Program*, Providence, RI, 1983.

Canada's Department of Fisheries and Oceans established a zoning scheme in Prince Edward Island's waters to manage aquaculture. The system established three distinct zones in all the province's coastal waters which require different levels of scrutiny by the government when an applicant applies for an aquaculture permit.<sup>112</sup>

The state of Oregon uses management zones for its estuaries.<sup>113</sup> Estuarine habitats were mapped which enabled the state to divide its estuaries into three broad management classes: development management; conservation management; and natural management. The classification system defines the overall level of development permitted in each estuary. Local estuary plans are then developed which must be based on the overall designation. Management units are then designated within each estuary. A management unit is a discrete geographic area defined by biological and physical characteristics and features, within which some uses and activities are promoted, protected, or enhanced and others are discouraged, restricted, or prohibited. All permitted uses must be consistent with the stated management objective that is developed for each management unit.

Belgium has zoned its continental shelf for the purposes of regulating sand and gravel mining. The four zones are: zone 1 (navigation areas) - mining is prohibited; zone 2 (fishing grounds) - mining is prohibited; zone 3 (southern part of the Belgian continental shelf) - mining is allowed when ecological monitoring is conducted; and zone 4 (northern part of the Belgian continental shelf) - mining is allowed after preliminary monitoring, with continuous ecological monitoring during the mining operation.

State government, with substantial input by environmental, economic, and recreational interests and the general public, should examine the applicability of the concept of use categories to its coastal waters. The state marine/estuarine water classification program can provide the foundation for a broader, use-based zoning scheme. Use designations coupled with performance standards can reduce use conflicts, provide resource users with predictability, reduce the regulatory/administrative workload, and ensure the sustainability of the marine environment by encouraging certain activities in suitable environments and discouraging or prohibiting other activities in ecologically sensitive environments.

#### d. Special Management Areas

The intent of designating special management areas is to specify areas of the marine environment that have particular management needs. Such areas could be habitat vital to ecologically or commercially important species of marine life, areas of high biological productivity or diversity, or threatened or endangered species habitat. Special management areas can be designated to protect a particular quality of a site such as its role as a fish nursery area, to establish recreational areas, or to set a site aside for protection from a wide range of intrusive uses.

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<sup>112</sup> Jim Jenkins, Department of Fisheries and Oceans, personal communication, September, 1990.

<sup>113</sup> Oregon Department of Land Conservation and Development, The Oregon Estuary Plan Book, Salem, OR, 1987.



North Carolina has designated several areas of its coastal waters as Outstanding Resource Waters.<sup>114</sup> This program authorizes the state to classify certain unique and special surface waters upon finding that such waters are of exceptional state or national, recreational or ecological significance and that the waters have exceptional water quality. The criteria for designation include: (i) outstanding fish habitat; (ii) unusually high level of water-based recreation or potential for such recreation; (iii) waters abutting areas that have received special recognition (e.g. adjacent to a National Wildlife Refuge); (iv) waters which are of special ecological or scientific significance, such as habitat for rare or endangered species or areas for research and education. Management plans are then developed for each of the areas designated as ORWs and additional permitting requirements on land-based activity are imposed. The outstanding resource water classification should be examined for its applicability to Maine's coastal waters.

Two states with marine reserves programs are Florida and California. Florida has established 41 aquatic preserves which are state-owned submerged lands in areas which have exceptional biological, aesthetic, and scientific value.<sup>115</sup> The state develops educational programs and management plans for each of the preserves and prohibits certain activities such as oil and gas drilling, mineral mining, and waste discharges that are contrary to the purposes of the preserve. California has designated over 100 intertidal and subtidal marine areas under several different programs have been established to protect marine life or provide underwater recreational opportunities.<sup>116</sup>

A study recently completed by the Maine State Planning Office calls for establishing an ecological reserves program.<sup>117</sup> The recommended goal of the proposed program is to establish ecological reserves to be used for scientific research, long-term environmental monitoring, and education. The reserves would represent all of Maine's ecosystem types. Uses would be restricted within reserves to conform with the objectives of the program. While the intent and focus of the study and its recommendations are on Maine's terrestrial environment, some analysis was devoted to the intertidal marine environment. However, a much greater level of analysis and public discussion for the intertidal and subtidal marine environment is necessary before appropriate marine reserves are identified. If the Legislature establishes an Ecological Reserve program as recommended by the study, it is suggested that the new program, in conjunction with relevant state agencies, carry out an investigation into establishing ecological reserves in the marine environment.

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<sup>114</sup> Derb S. Carter, "Outstanding Resource Waters Classification Provides Protection for N.C. Coastal Waters," Legal Tides, vol. 4, no. 3, March 1990.

<sup>115</sup> Donna R. Christie, Florida's Ocean Future: Toward a State Ocean Policy. Report for the Governor's Office of Planning and Budgeting, 1989.

<sup>116</sup> Richard F. Ambrose et al California Comprehensive Offshore Resources Study: Summary of Biological Resources, submitted to State Lands Commission, (Marine Science Institute, University of California, Santa Barbara, 1989)

<sup>117</sup> Janet McMahon, An Ecological Reserves System for Maine: Benchmarks in a Changing Landscape. Report to the 115th Legislature, February 1991. Maine State Planning Office.

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## ***VI. WHERE TO GO FROM HERE***

This report provides an overview of Maine's laws, management and policies concerning the marine environment as well as a description of the issues that Maine will face in the future. The report outline some of the options available for addressing these concerns. These options need to be further explored through a public policy process that provides for meaningful participation by all levels of government and the citizens of Maine. As this effort continues, consideration must be given to both the short- and long- terms needs for marine resource management. The following recommendations lay the groundwork for development of a comprehensive marine policy:

### **I. Policy and planning**

- recommend priority uses of Maine's coastal waters based on identification of current and potential use conflicts and impacts of uses on both the marine environment and other uses;
- recommend processes for resolving resource-use conflicts;
- recommend steps for protecting critical marine habitats.

### **II. Coordination and cooperation**

- recommend methods to better coordinate and consolidate existing policies and programs affecting the use of Maine's marine waters;
- identify opportunities for institutional changes that would improve coordination and efficiency;
- explore opportunities for federal, state and local coordination.

### **III. Information management, research, and education**

- recommend priority research needs for making management decisions about coastal and marine resources and assess how to better integrate ongoing research and monitoring activities into the decision-making process;
- recommend information requirements for ecosystem management including a computerized mapping program useful for planning and regulatory purposes; and
- recommend necessary changes in marine education in the state.